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Instructing in Map Reading

By Captain C. D. Herron, 3rd Field Artillery

WHAT does Private Sob Sobieski, U.S.A., know about map reading? Nothing.

And how many of our officers read maps lamely and laboriously, with scowling brow and muttered word, living over again second-reader days? Without doubt, too many.

Yet map reading is an easy thing—far easier to learn than is the alphabet. There is no reason why every private in our army should not be able to receive rainy-day instruction in Minor Tactics on the 12-inch Leavenworth map.

Map reading would have been universal years ago had it not been for that absurd dogma, "The way to learn to read a map is to make one." It is just as sensible to say that to read the English language one must first write it. Which is to say, that no one can read who cannot write! But it is this same foolish saying that has beclouded the issue and obscured the vision of our would-be teachers of map reading.

John Jones, who wants to learn to read a map, is led off through the devious paths of scale manufacture, horizontal equivalents, clay models, determination of the true meridian, etc., until his only remaining sensations are shame at his own density and wonder at the great wisdom of his instructor.

Many text-books purport to teach map reading, but do not. Some of them teach map making admirably, but the writers are mostly map makers, and do not separate, in their own minds, the two subjects of map making and map reading.

When the mind of the instructor is muddy, the pupil is lost.

It is the belief of the writer that every man of the Regular Army should be able to read a map, and it is desired to set forth, as briefly as possible, a method whereby an officer may perform the cranial operation with such success that Sob Sobieski and John Jones will in one hour be completely cured of their ingrowing ignorance of map reading.

It is especially to be borne in mind by instructors that all extraneous matter must be avoided. Remember that every single fact introduced constitutes one more stumbling block; stick to the absolute essentials of map *reading*, and leave the story of your honorable achievements in map *making* to some other occasion.

Also, suppress the pestiferous individual who seeks to make of record, by means of alleged questions, his own vast knowledge on the subject. He but beclouds the issue.

METHOD

Use a 12-inch map hung on the wall, or enough 3-inch maps to give one to each three men.

Explain first that there are but four elements to map reading: *Direction, Distance, Conventional Signs,* and *Contours.*

DIRECTION:

Starting with *Direction,* explain that the arrow on the map points to the north; that if there be no arrow, the north on any modern map is at the top.

The North being at the top, the South is at the bottom. The East is on the right hand, the West on the left.

To fix this latter fact in his mind, have the recruit stand up, facing the north. Point out that, as his right hand is in the east and his left in the west, so it will be looking from south to north on the map.

Two kinds of arrows are sometimes put on maps, one completely barbed and feathered, the other barbed and feathered on one side only. The complete arrow points to the true north, or the north of the north star; the incomplete arrow to the magnetic or compass north. Only on a line striking into the United States through South Carolina and crossing the border into Canada from Michigan, up to the *magnetic* pole in Canada, does the compass point to the true north. At any other point, the north end of the compass swings towards said line, and the farther one gets from the line the farther the compass swings from the true north, until in Oregon or Maine its swing towards this central line is as much as 25 degrees. The magnetic arrow on a map is necessary for use of the map on the ground in connection with a compass.

Require an answer from each member of the class as to what direction he must travel to go from one map point to another; ask the direction of roads, streams, etc.

Try them all on the question, "What direction?" When they can answer, they have the Alpha and Omega of the matter of direction.

This is the appropriate place to explain that all map lines are parallel to the ground lines they represent.

Do not touch upon orientation until you can take your class out of doors with local maps.

DISTANCE:

Explain to friend Sob that the map distance between any two points shown on that map bears a fixed and definite relation or proportion to the real distance between the real points. Understanding this, from his map, he can answer the question, "How far?"

Illustrate somewhat along the following lines: We measure on a map and find the distance between two points to be 1 inch. Then we measure the real distance on the ground and find it to be 10,000 inches; hence the relation between the map distance and the real distance is 1 to 10,000, or $\frac{1}{10,000}$. Now, if the map is properly drawn the same relation will hold good for all distances, and we can obtain any ground distance by multiplying by 10,000 the corresponding map distance.

This relation need not be $\frac{1}{10,000}$, but may be anything, from $\frac{1}{100}$ that an architect might use in making a map or plan of a house, up to one over a billion and a half, which is about the proportion between map and real distances in a pocket-atlas representation of the whole world on a 6-inch page. Map makers call this

relation the "scale" of the map and put it down in a corner in one of three ways.

For the sake of an illustration, say the relation between map and ground distances is 1 to 100; that is, 1 inch on the map is equal to 100 on the ground. The scale may be written:

First: 1 inch equals 100.

Second: $\frac{1}{100}$.

Third: Graphically. (Illustrate by scale on map.)

These expressions mean one and the same thing. A variation of the first method on a map of different scale might be: 1 inch equals 1 mile. Since a mile contains 63,360 inches, then the real distance between any two points shown on the map is 63,360 times the map distance.

To find the ground distance by the third kind of scale, copy it on the edge of a slip of paper, apply the slip directly to the map, read off the distance, and answer the question, "How far?"

Use your maps and make every man in the class answer the question, "How far?" Do not omit questions; there is nothing like them to stimulate the attention of an audience.

Next take up conventional signs. Point them out on the map, and tell what they stand for. Explain that they cannot be drawn to scale, as some would be so small that they could be made out only with a magnifying glass. If the exact dimensions are of any importance, they can be written in figures on the map. For instance, bridges. Any map has enough conventional signs for a first lesson.

CONTOURS:

Here comes the tug-of-war.

Contours are but conventional signs. They show:

1. Height.
2. Slopes or grades.
3. Shape of ground.

When a soldier can extract from a map all the information shown under these three heads, his understanding of contours is, from a military point of view, complete, and he should not be burdened with anything further in the line of theory.

Point out the contours on the map; explain the difference between the contour and the road-sign, and show how the streams cross the contours unmistakably, while the contours are always approximately parallel and do not cross each other. Also point out the zigzag character of the stream lines. Contours represent ground-lines that are horizontal and whose meanderings follow the surface, just as the edge of a flood would follow the irregularities of the hills about it. The usual illustration of the rising lake may be used.

Contours show the *height* of the ground they cross. Usually the contour has labelled on it in figures the height above some starting point, called the *datum plane*—generally sea level. If, with a surveying instrument, you put in on a piece of ground a lot of stakes, each one of which is exactly the same height above sea level—that is, run a line of levels—then make a map showing the location of the stakes, a line drawn on the map through all the stake positions is a contour and shows the position of all points of that particular height.

On any given map all contours are equally spaced in a vertical direction, and the map shows the location of a great number of points at certain fixed levels. If you know the vertical interval between any two adjacent contours, you know the vertical interval

for all the contours on that map, for these intervals on a given map are all the same. (Here point out the vertical interval on the map used.)

With reference to a point through which no contour passes, we can only say that the point in question is not higher than the next contour up the hill, nor lower than the next one down the hill. For the purposes of any problem, it is usual to assume that the ground slopes evenly between the two adjacent contours, and that the vertical height of the point above the lower contour is proportional to its horizontal distance from the contour, as compared to the whole horizontal distance between the two contours.

Indicate on the map points between contours and have the members of the class figure out their approximate height. There will be much creaking and lumbering of rusty and disused cranial machinery, but Sob and John will finally arrive.

Point out that on maps of small areas the vertical interval is usually small—perhaps as small as one foot; on maps of large areas on a small scale it may be very great—even 1000 feet.

When you are sure they all understand the matter of absolute height by contours, proceed then to *slope*.

The best way to produce an intelligent idea of slopes is to have the men measure on their maps distances between contours; the rise between any two contours is the V. I. of the map, and the slope can be expressed as a fraction, the numerator of which is the V. I. and the denominator the distance between the contours.

Should there be a slope scale on the map, have the men measure off by a distance scale the horizontal distances in feet corresponding to the different degrees of slope. Or, much better, have each man make for himself a scale showing map distances corresponding to rises of 10 feet in 100; 20 feet in 100, etc. The map horizontal distance corresponding to a rise of M feet in 100 is: $\frac{VI}{n} \times$ map distance for 100 feet.

Omit at this time any explanation of the military system of maps wherein the horizontal equivalent for particular slopes is a constant.

Let them figure out later their own slope scales for different maps, and the system will dawn upon them. *After* all have figured out a few slopes, point out the rule that where the contours lie closest the slope is steepest; where they are farthest apart the ground is most nearly flat. Keep them on this point until all can give promptly an approximate per cent. for the slope at any indicated spot on the map.

You now take up the last property of contours—their power to show *ground shapes*.

This is easily appreciated when concrete examples on the map are pointed out by the instructor, who should go into considerable detail in describing particular features.

Explain that, while the contours on an ordinary map may seem much involved, it is only on account of their number, their many turns, and the fact that many of them run off the paper. Follow through its tortuous course any contour and it will be found to close back upon itself just as truly as do the high-tide lines around the great continent of Australia or of North and South America. The contour that marks the sea level differs only in size and altitude from the little ones that mark the mountain-tops on your map.

If the map embrace a whole conti-

nent or an island, all the contours will be of closed form, but if it embrace only a part of the continent or island, some of the contours will be chopped off at the edge of the map, and we have the open form of contour.

The closed form may indicate a hill or basin; the open form, a ridge or a valley; sometimes a casual glance does not indicate which.

Take up first the contour of the open type. If the map shows a stream running down the inside of the contour, there is no difficulty in saying at once that the ground feature is a valley. But if there is no stream line, does the contour bend show a valley or a ridge?

First of all, there is a radical difference between the bend of a contour round the head of the valley and its bend round the nose of a ridge.

Compare on the map the valleys and the ridges. Point out that the bend of the contour round the head of the valley is much sharper than the bend of the contour round the nose of the ridge.

This is the general truth, not only in regard to maps but also in regard to ground forms. Study any piece of open ground and note how much wider are the ridges than the valleys. Where you find a "hog back" or "devil's backbone," you have an exception to the rule, but the exceptions are not frequent enough for worry.

To tell whether a given point is on a ridge or in a valley, start from the nearest stream shown on the map and work across the map to the undetermined point, keeping in mind that in a real trip across the country you start from the stream, go up the hill to the top of a ridge, down the other side of the hill to a water-course, then up a hill to the top of a ridge, down again, up again, etc.

All your travel, on a map, as in life, must be valley, ridge, valley, ridge, valley, ridge, etc., till you run off the page. Never is there a hill without its valley; never is there a valley without its hill.

Point out also the rule that every angle in a contour means a ridge or a valley; *if the angle points to the lowlands, it marks a ridge; if to the height, it marks a valley.*

The stream flows down the valley and across the contour; the sharp angle of the contour points always *up* stream. But where one stream joins another, the angle made by the two never points *up* stream.

If the contours are numbered, you have only to look at the number to say where the low and where the high places are; but to read a map with any speed one must be quite independent of these numbers. In map reading look first for the drainage lines.

These drainage lines are the skeleton upon which the whole map is hung. Then pick out the hilltops and ridges, and you have a body to clothe with all the details that will be revealed by a close and careful study of what the map maker has recorded.

One last thing to explain: A closed contour may outline a depression or a hill. Most of the depressions or hills can be identified by the stream lines running *towards* or *away from* the closed contour. But if not, the "valley, ridge, valley, ridge, etc.," test will always give the answer.

For years the writer has been teaching map reading to enlisted men; so far not one has appeared who could not or would not learn the subject from A to izzard in two lessons.

All may learn—even Sob.

The Field Kitchen Problem

1st Lieut. C. N. Sawyer, Infantry

THE armies of all the great Powers have struggled with the field kitchen problem. Troops must eat, and they must move, and must camp frequently in large masses. Due to the fact that many of the men of foreign armies are accustomed to a diet much less varied and tempting than North American troops, their problem has been largely solved by the use of soup- or stew-kitchens. The Canadians, under war conditions, have found that their troops would not be satisfied with three meals of stew per day. Moreover, they have found that health, physical vigor, and contentment are products that demand more than stew, no matter how nourishing or dressed-up it may be.

Until a recent date, United States troops have had nothing but field ranges for the individual company and, when in the field, Equipment "A" provides only for a light grate. There are now a few so-called field kitchens in use, more for test purposes probably than for any other reason. The fact that they are being tested, however, shows that the problem is being considered.

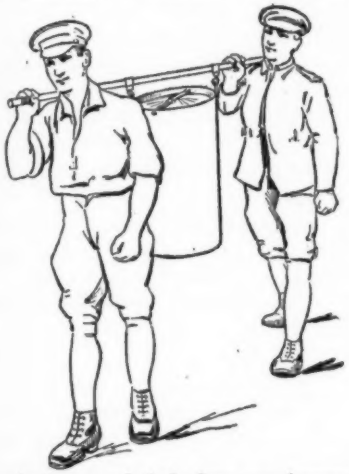
In view of the authorized increases in the regular army, the problem of changing from small posts to large ones and the implied building program necessary thereto, it is quite within the realm of probability that many of our organizations may spend a large part of their time for a few years under canvas or in cantonment. Here arises an opportunity for the test of field kitchens under the very best of conditions, where they may be studied at some leisure, and absolute unquestioned data concerning them be obtained.

The Infantry officer is, necessarily, more concerned with field kitchens than perhaps the officer of any other branch. There are more men in this branch to be fed than in any other arm of the service. They are found in any ordinary situation with a greater number of men per square yard than those of other troops, that is, their density is greater. The problem of transportation and supply, always important, becomes increasingly so because of the increase in density. Weight and road space are also considered essential factors in this problem, but the most casual observer along our southern border, during the height of the recent mobilization period, would have found less attention paid to road space by those in charge of troops than to any other question, whether among the regulars or National Guard.

We cannot help, therefore, but state the following as a guiding principle: that there is a point at which the comfort, contentment and health of troops may be sacrificed for road space or weight without any compensating advantage. This principle can no more be ignored than can an efficiency engineer disregard the fact that some contemplated saving will cost more for overhead charges than the new plan will save.

There remains yet to be discovered a satisfactory method of cooking food for troops in our service which will involve carrying less weight than the regulation field range. However, the increase in

density in modern war makes the disadvantage of the field range more apparent. Even in permanent camp, where all the comforts of life exist, field ranges are decidedly a nuisance. They are



washed out and their fires are drowned out by every tropical downpour, and a view of any camp after some of the Gulf storms was a distressing sight, while, if one had to wait for a fire or assisted in

trying to get the range out of the rushing torrent that every kitchen apparently attracts, one began really to appreciate their deficiencies. For continuous use, they should be elevated with a brick, stone or concrete foundation, unless it is desired to break the cook's back.

Real trouble with the field ranges develops when troops are on the move. Old cooks say that they like them, but they never saw anything else. The company commander insists that they

are fine, but he does not unload them or set them up or change them every time a downpour washes them out. The left-over food is wasted for it cannot be carried. Extra details are necessary on arrival in camp, to put up the tent, chop wood, peel potatoes, get water, and

countless other tasks. True, our rations in war-time are due for somewhat of a cut, but we spend most of our time on a peace basis, and these extra details run into more man-hours per day than we imagine unless one counts them up. Either the march has to be halted to cook and eat a very late dinner, or else a

cold lunch of the kind that is thrown away is carried, and a still later dinner results on arrival in camp. Every company wagon must join its organization before the meal can be cooked. Now, that only two wagons are allowed to a battalion, two ranges, or two grates, if you are traveling light, go in each wagon and likewise two sets of rations. Company commanders heartily disliked this one-wagon-for-two-companies arrangement, and for them the army went to pieces when they lost their own individual wagons. Since the latter have gone for economy why not carry the process of reduction further and have a battalion mess? The economies in all directions are greater thereby, and the Quartermaster Corps itself is considering a battalion field mess.

In view of the inadequacy of soup- and all-stew carts for our own troops, the disadvantages of the field range, and the necessity of economy as pointing toward a battalion or a regimental field mess, let us consider the possibilities of field kitchens. Before describing the machines in actual use, I shall list some of the conditions that such kitchens should fulfil when compared, one with another, to determine the good and bad qualities of both. Such tests should be made before a board of officers representing every branch of the mobile service, and the machines should be operated by good army cooks under the direct supervision of the experts representing the manufacturers, so that the capacity and performance of the machines and not that of the cooks are tested.

A fair, comparative test of these field kitchens would include the following:

1. Mobility; weight and action on the road; passage of obstacles, covering bad ground; balance, clearance, topheaviness, turning space; tractive force required; effect on horses or mules.

2. Fuel consumed per day; adaptability to fuel of locality.

3. Capacity as indicated by variety of dishes obtainable per meal.

4. Capacity as indicated by number of men fed; relation of that capacity to tactical units.

5. Elasticity of capacity; providing for emergencies, such as prisoners, additional or increased units, outlying detachments.

6. Capacity tested by units of sufficient proportions to make tests exhaustive over a reasonable period of time.

7. Action under service conditions as follows:

a. Feeding unit in stationary camp.

b. Feeding unit on the march, cooking en route, serving hot noon-day meal en route, and hot supper on arrival of troops in camp.

c. Feeding outposts, or detached posts, hot food from the original unit, and feeding remainder at the same time.

d. Feeding entire unit hot food on the firing line (in the trenches or by protected approach if in the open) with kitchens outside the zone of fire.

In each of these cases the following must be considered:

A. Convenience and ease of operation; time consumed in cooking and feeding; help required; quality of the cooking; variety and condition of the food as served, and the service; continuity of service from kitchen to troops throughout the period.

B. Weight to be lifted in the cooking vessels proportioned properly; proper

height of ovens and fireboxes for economy of effort in tending them.

C. Efficiency of the fireless cooker apparatus if present; ease of cleaning and handling fireless cooker vessels; slopping of food in transit in ovens, cooker cans, and in fireless cooker flasks.

8. Materials and workmanship.

9. Completeness of equipment carried on the kitchen.

10. Necessary auxiliary equipment; such as tools, axes, saws, hammers, shovels, pickaxes, required to be carried on separate transportation; its weight and space.

11. Ability to clear at a gallop when coming under fire; loose equipment that will be left behind when moved in a hurry.

12. Ability to save either limber or cooking section if the other is destroyed.

13. Visibility in the zone of fire and out of it.

14. Standardization of equipment for use in all branches of the mobile army, in all theatres of operation and occupation, and under all extremes of weather and temperature; appropriate ration for the extremes of climate to be used (some oils solidify in winter, yet one cannot choose as to the time of year for operations nor the climate).

15. Ease of repair in the field; interchangeable parts; necessary spare parts.

16. Independence of the ration section (ration carrying capacity requiring supply but once in twenty-four hours).

17. Initial cost of equipping a regiment.

18. Serviceability under field wear and tear; cost of upkeep and replacements.

19. Availability for medical and field hospital use; sterile dressings, boiled water and the like; hospital cooking.

20. Road space, as related to service, contentment and physical welfare.

Only one field kitchen that will fulfil even a small percentage of the above conditions has ever appeared on the American market. Nor is it surprising that this kitchen should have been invented and developed by North Americans who are actually engaged in war. Captain Halsey Yates, now Military Attache to Roumania, was among the first to discover the merits of the Canadian field kitchen, manufactured by the McClary Manufacturing Company, of London, Canada, and he obtained the consent of the Quartermaster General of the Army for the purchase of one of these kitchens to be used in actual tests. It was assigned to the 30th U. S. Infantry.

A series of try-outs was conducted, in which the capacity of the kitchen was tested practically for field service under all ordinary conditions. These try-outs were entirely satisfactory, and a report, in detail, was made of the tests and conclusions of those who conducted them.

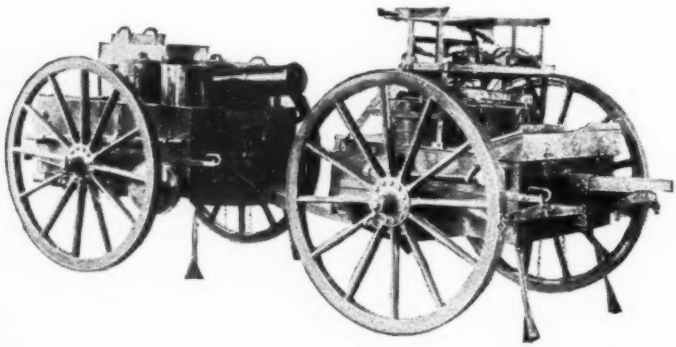
As a result of these tests, it was demonstrated that the kitchen in question has mobility; that the fuel consumed is equal to that of one field range; and that it takes the place of four such ranges. The menus [1] prepared

[1] Sample of average daily menu.

BREAKFAST.	DINNER.	SUPPER.
Oatmeal.	Roast beef.	Beef stew.
Scrambled eggs.	Baked sweet potatoes.	Stewed apples.
Fried potatoes.	Cream corn.	Green onions.
Bread, butter.	Brown gravy.	Coffee, milk.
Coffee, milk.	Rice pudding.	Bread.
	Coffee, milk, bread.	

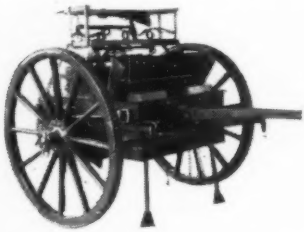
included the greatest possible variety. It will bake, roast, boil or fry, in stationary camp or while traveling. Its thermos cans and limber serve the cooked food, hot, twenty-four hours after it has been placed in them, within a radius limited only by the motive power. It has an elasticity of capacity that is remarkable. Its equipment is nearly complete. The good quality of its cooking has been pronounced upon by the officers and men of the entire regiment, for each battalion has had the opportunity of using it. It works best under a certain arrangement of stews, roasts, boils, and fried dishes, if its utmost capacity is to be obtained, but this arrangement may be easily worked out if any thought is given to the menus.

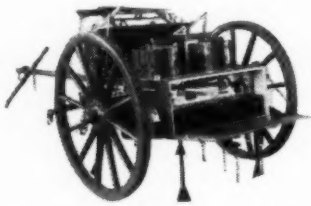
Three additional McClary kitchens were requisitioned to equip the regiment for complete exhaustive tests under field conditions on the march, one for each of the other two battalions, and one for the group composed of the Machine-Gun Company, Headquarters Company, Supply Company, Medical Detachment, and Staff Officers. The request was disapproved.



This field kitchen, fireless cooker pattern, weighs about 3720 pounds and, with driver and rations, about 4500 pounds. It consists of a limber and a detachable cooking section.

In the front of the limber are two large bins and space for provisions and fuel. The limber has a seat for three men and straps for rifles and tools.





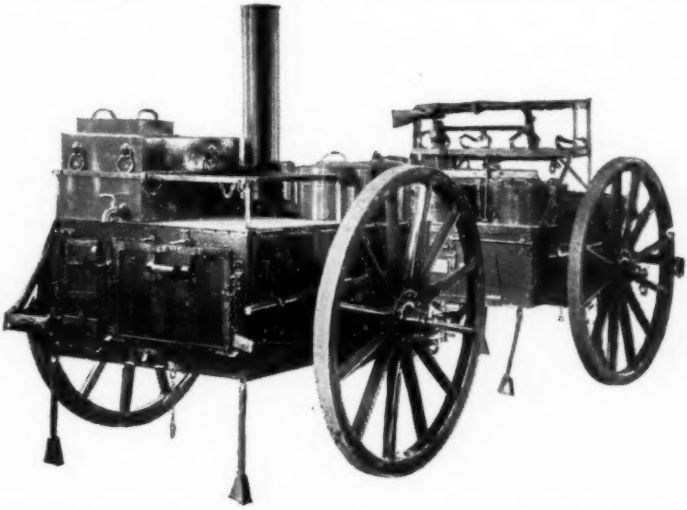
Underneath the seat and in rear of it are three removable metal fireless-cooker flasks which take three complete cooker cans, each of twelve gallons capacity. A cupboard in the rear of the cans, at the back of the limber, contains

condiment boxes, tools, cutting and carving table and space for extra tools.

The cooking section has two separate fireboxes; one in front for boiling, with a capacity of four cooker-cans of twelve gallons each; one in rear, heating an oven containing two roasting pans twenty-four inches by twenty-four inches, with a capacity of from two hundred and forty to two hundred and fifty pounds of meat.

The fireboxes are lined with heavy cast-iron and have heavy cast baffle plates over the top of the fire. Above the rear firebox and oven is a smooth steel top which may be used as a griddle, and where two coffee boilers of twenty-eight gallons each are placed (only one being shown in the figure). The smokestack is of telescopic design and can be extended to six feet, or lowered to three feet, and when not in use it may be dropped to the level of the top of the kitchen.

In addition to the many excellent features clearly set forth in the official report, above, concerning this kitchen, may be mentioned the scientific use of every available pound of weight and every inch of space, and its careful design along well-known field artillery principles as regards weight, height, turning space, tractive force required and the angle of its application, and balance. The boiling cans are as large as can be conveniently lifted from the range, handled and served. They are readily cleaned and do not slop over.



They are constructed in such a way as to drain easily, their covers being quickly fastened or unfastened. They may be readily changed from or to the heat or cold retaining flasks. The coffee boilers permit of large quantities of coffee being made, and of convenience in serving, because of their large faucets. The boilers are removable and hence easily cleaned. The kitchen can be rationed any time after arrival in camp in the evening and will carry sufficient food for one day, less the bread component, if baked bread is used. If

the seat is removed and the driver mounted, as would probably be done in the theatre of operations, the space thus provided could be used for bread and fuel. As the kitchen follows the troops, the cooks walk. The hourly halts for infantry are sufficient for all attention the cooking requires en route.

There has recently been added to the equipment of this kitchen oil burning attachment which can be used where oil is furnished for fuel. This is in response to present American inclinations.

The size of a unit served by a field kitchen is important in many ways. This particular kitchen is well suited for an American battalion, which is a logical unit for such a purpose. So used, the eight cooks and four mess sergeants of the battalion are sufficient to handle it without keeping all of them up day and night, as too often happens with the present field range. Additional details of enlisted men, to work at the kitchen, need scarcely if ever be used.

One kitchen for each two companies would perhaps give greater mobility as regards independent action, but additional cost, road space, teams, drivers, and many other considerations render this impracticable. Four such kitchens can be added to every regiment without increasing, to any extent, the road space that may be actually used. Fifteen field ranges weigh more than does this kitchen, and make a fair load for an escort wagon. On a basis of three peace-strength battalions, twelve hundred men, on the lightest ration—about three pounds per man—and assuming that only two-thirds of the ration is carried after breakfast, the very least that is taken from the baggage section by the use of these kitchens is twenty-four hundred pounds, to say nothing of the labor saved in connection with the field ranges. That the elimination of all field ranges and rations from the baggage section will save more than the two wagons shown, is the belief of the officers of the regiment who have studied the problem, and it was to permit of such actual experiments that the additional kitchens were asked for.

General Order Number 39, 1915, calls for a march-kit cooking outfit, no field ranges being permitted with Equipment "A," and when a company is detached for separate duty, it is still no worse off than in the field under present conditions with Equipment "A." Its cooking problem is no harder than at present where there is but one authorized wagon for each two companies.

This kitchen is so much more economical in fuel, losses due to evaporation, wastage at the end of a meal, saving of leftovers, and in men needed for operation, that there is little comparison with any other form of kitchen yet shown, considering character of menus and service. The eight cooks and four mess sergeants of a battalion should be able to handle it without outside assistance, except a little competent direction.

Field Fortification

From Authentic Sources

TRENCH WEAPONS.

1. The present war in Europe has shown that, when the direct fire of powerful modern arms becomes ineffective, the combatants return to the weapons and machines of ancient warfare. Grenades, abandoned for a hundred years, and catapults, slings, onagers, etc., are now in use. Grenades appear to have been first used in 1516, at the siege of Arles. The city was threatened with investment; a great quantity of grenades which the defenders were to use in throwing from the top of the walls among the assailants were sent there. The grenades were made of glass, globes, jars, kegs,and firepots. In 1677, at the siege of Stettin, the defenders used grenades attached to rods, which were fired from muskets, although the regular method was to throw them by hand or by means of a shovel. Regiments of grenadiers were formed, but, at the end of the seventeenth century, as the fire of infantry became predominant, grenades were given up.

Machines, such as catapults, slings, onagers, etc., are known to have been used eight centuries B.C. The Bible tells us that the walls of Jerusalem were provided with "machines constructed by a very wise engineer to throw bolts and large stones."

At the present time rapid-fire weapons having forced opposing armies to entrench, warfare has become a long siege with frequent sorties. Under these conditions, the grenade has become very useful, both on the offensive and the defensive. Its effects are specially useful at the moment of assault, when by its deadly explosions, following the violent artillery preparation, it completes the demoralization of the defenders of the hostile trenches.

2. Grenades may be classified, according to their range, into:

(*a*) Hand grenades, with range of 30 to 35 yards. These may be explosive grenades, suffocating grenades, poison-gas grenades, tear-producing grenades, incendiary or smoke-producing grenades.

(*b*) Rifle grenades, with a range of 80 to 200 yards.

(*c*) Grenades, or bombs, for trench weapons.

PART I.

HAND GRENADES, RIFLE GRENADES, AND TRENCH WEAPONS.

3. *Explosive hand grenades* are made up of a case containing a certain quantity of explosive. As regards ignition, they are divided into two types: percussion and time. Some are a combination of the two, and have both time and percussion fuses. As regards tactical employment, grenades are also divided into two classes: defensive, relying upon fragments of bullets; and offensive, relying upon the blast of high explosive.

4. *Handling and Transportation.*—Great precautions should be taken in the handling and transportation of grenades. They are always dangerous,

especially when handled by men ignorant of their make-up or assembly. For transportation, they should be carefully packed, with the fuses in separate boxes. They should be protected from dampness, and the fuses should be kept

FIG. 1.

entirely separate from the explosive cases. The safety devices should never be removed until the moment of throwing.

5. *Grenade Throwing.*—The instructions for priming and throwing of each type should be carefully followed. Grenade work should be rapid, but without hurry, with calmness and coolness. The grenade should be thrown immediately after its fuse is ignited, even when there is some doubt whether it has been properly ignited. Men should be carefully and thoroughly trained in grenade throwing. Their use by trained men greatly reduces the risk of accidents and the expenditure of grenades. The proper method of throwing is shown in Figures 1 to 5.

Initial position (Fig. 1): Aim at target with the extended left arm. With the grenade in the right hand, the right arm falls naturally alongside the body. The shoulders, the extended left arm, and the target should be in the same vertical plane.

FIG. 2.

First motion (Fig. 2): Left arm maintained in the direction of the target. Carry the grenade to near the left hand for igniting.

Second motion (Fig. 3): Left arm maintained in the direction of the tar-

get. Carry back the right arm by swinging it in the vertical plane, eye following the grenade to avoid hitting it against anything in rear. Extend the left leg, bending over right leg.

Third motion (Fig. 4): Look again

FIG. 3.

at the target, or at the aiming point if there is one in the trench.

Fourth motion (Figs. 5-a, 5-b): With the right arm, describe an arc of a circle in a vertical plane, the right shoulder and the body following the movement of the arm. Extend the right leg, bend the left leg. The left arm is swept vigorously through the air following the left shoulder, which is refused.

The grenade thrown vigorously in this way will go in the direction toward which the left arm is aimed. The right arm acts like a catapult. It should never be thrown horizontally nor with the elbow bent. The fire must be plunging. The duration of the execution of the four motions is about two seconds.

6. *Training in grenade throwing* should have the following objects in view:

(*a*) To teach every infantry unit so that it can rapidly undertake a grenade fight when circumstances demand it.

(*b*) To train selected squads to execute sudden grenade attacks.

FIG. 4.

The squad should be organized into a squad leader, two riflemen, two grenade throwers, three ammunition bearers. It may be followed by a chain of men to pass forward ammunition, and a squad of pioneers. As soon as

the first line of the enemy is reached, the grenade fighting commences. In the trenches and approaches there will always be angles and traverses that must be cleared of the enemy.

7. *The typical method of trench clearing* is shown in Figure 6. The enemy

FIG. 5A.

must be driven back step by step, and a formation adopted that will minimize the losses caused by his grenades. A rifleman (f^1) acts as a point, stops the enemy's approach, and protects the grenade throwers. Two grenade throwers (1^1, 1^2) throw grenades to points 1, 2, 3, then to 1′, 2′, 3′, always beyond the defiladed spaces, and so as to assure a constant and progressive clearing out of the trench. The squad leader (*Ch*) directs the fight, corrects the fire, organizes the relief of the grenade throwers and of the ammunition bearers, superintends the ammunition supply, and prepares to defend his ground foot by foot if progress becomes impossible. The three ammunition bearers (p^1, p^2, p^3) are stationed several paces in rear so that they can get out of the way without stumbling over each other. They pass up the grenades in bags. A chain of men passes up the ammunition from the nearest grenade depot. A squad of pioneers (*P*) is stationed close in rear of the ammunition bearers, ready to construct a barricade or to demolish those of the enemy. They are supplied with shovels, picks, empty sand-bags, bombs, and explos-

FIG. 5B.

ives. They may also have rifle grenades to interfere with the enemy's ammunition supply, and one or two men with automatic rifles to defend the barricades.

The grenade squad must preserve silence and observe carefully all noises coming from the enemy. When the

leading group decides that the enemy is overwhelmed, the first rifleman creeps forward carefully in the smoke, peeps around the angle, and signals to his comrades. Thus they progress from turn to turn and from traverse to traverse. The squads must not bunch up; not more than three men should be together; they must advance prudently and watch for traps, fougasses, etc. The long, straight portions of trench are often enfiladed by rifles or machine guns placed in the traverses. The enemy also hides at the end of a blind lateral trench, the entrance of which is masked by a piece of painted canvas. If the advance is made too rapidly, the enemy comes out of his hiding place behind the grenade squad and cuts it off.

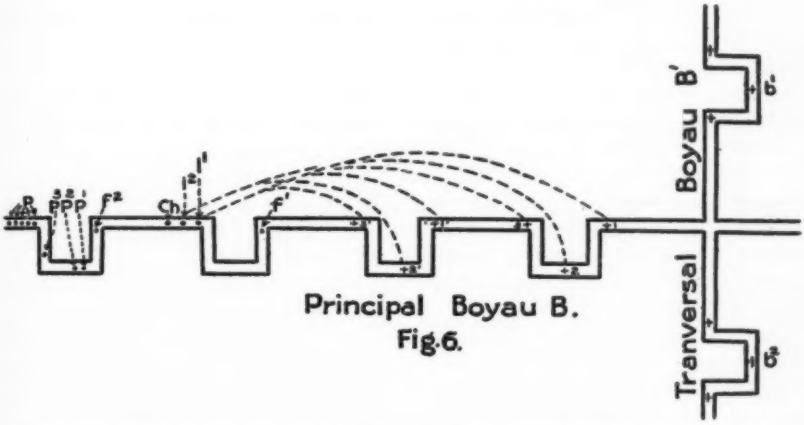
When a lateral trench is reached (B'), several grenades should be thrown in both directions, at least three at each traverse, as shown at b^1 and b^2. It should be explored and barricades established and guarded if it is not considered necessary to continue farther along it.

All the members of a grenade squad should be able to perform all the different duties and be ready to undertake them at once when ordered by the squad leader.

On open ground, grenade squads march in the formation of patrols.

8. *Rifle Grenades.*—A well-directed fire of rifle grenades demoralizes the enemy and causes much more severe losses than an artillery bombardment. The enemy's trenches should be carefully observed to ascertain the points where men are likely to be stationed, such as sentry posts, entrances to shelters, intersections of approaches, etc. Rifles clamped in racks should be directed at these points, in order that a grenade may be fired at them immediately upon the indication that they are occupied. Fire should be continued night and day at these points. In spite of the almost complete concealment of the enemy, his dispersion, and his protection by shelters, it will be possible to inflict appreciable losses upon him by a constant rifle grenade fire, directed at well-chosen points.

A well-directed rapid fire by small, perfectly-trained detachments, upon an enemy assembled for attack, or upon



Principal Boyau B.
Fig.6.

known and registered points of the communications, at the hour of changing reliefs, should give excellent results.

In assaults, the employment of men carrying rifle grenades should be closely coördinated with the other elements of the attacking lines.

In trench clearing, the fire of rifle grenades should be carefully executed by the supply squad which follows immediately in rear of the squad of grenade throwers. This fire should interfere with the enemy's supply and bar his lines of retreat.

The range of rifle grenades is about 200 yards at an angle of 45 degrees. The angle of fall is large, and makes their fire against trenches very effective. The rifle may be fired from the shoulder or from a special rack.

9. *Trench weapons* are divided into two general classes, viz., *high power,* which are handled by the artillery, and *low power,* whose propelling power is powder, compressed air, or springs handled by the infantry. Only the low-power weapons will be discussed. These are organized into batteries of four to six pieces and attached to battalions. The assignment of the weapons among the different battalions of the regiment is made so as to concentrate the maximum number at the most important points, with a view to the results to be obtained.

10. *Tactical Employment of Trench Weapons.*—Low-power trench weapons have a range which varies from 50 to 300 yards, according to the propelling charge and the setting of the time fuses. They are not very effective against matériel, but are very effective against personnel sheltered behind cover which gives protection from rifle fire.

On the offensive, they may be employed:

(*a*) Against works, such as machine-gun emplacements, nearly demolished by the artillery preparation, which the enemy, having been sheltered in deep bombproofs from this fire, has reoccupied.

(*b*) In parts of the front adjacent to those from which the offensive has started, with a view to supporting the attack in conjunction with the infantry remaining in the trenches and which has been reduced to a minimum; and in order to neutralize the corresponding hostile front and prevent hostile action against the flank of the attacking troops.

(*c*) After a successful attack, by moving forward to the captured front, and there rapidly organizing emplacements for its defense or for action against portions of the new hostile front which are too near to permit artillery fire against them, without danger to our own troops.

On the defensive, trench weapons may be employed:

(*a*) On parts of the front held by a few men where the effects of these weapons will compensate for the small garrison.

(*b*) On parts of the front which are close to hostile listening posts, small posts, or advanced works which threaten the first line.

(*c*) Behind the first lines, close to the second or third line of a position, with a view to making untenable parts of a line captured by the enemy.

11. *Location of Emplacements.*—The location depends primarily upon the objective. The fire has the most effect when it is oblique; but, in the first line, observation of the fire is easiest and the fire is more accurate. The emplacements are therefore located near the first line, preferably in parts of the line

most difficult for the enemy to reach, such as re-entrants, defiladed points, etc. Three or four alternative emplacements should be constructed on each line of trench; and the emplacements for a battery should be divided by traverses into positions for a platoon of two guns.

12. *Fire of trench weapons* is divided into four classes:

(*a*) Destructive fire: Against listening posts, small posts in course of construction, and blockhouses already damaged. This fire must be rapid.

(*b*) Offensive fire: At the time of the preparation for an attack, by adding to the artillery fire.

(*c*) Defensive fire: Rapid fire upon the parallels of an enemy, preparing for an attack; rapid, sudden, and unexpected fire at opportune times upon trenches and approaches captured by the enemy.

(*d*) Firing in periods of calm: This must be very rapid at any time that the enemy appears negligent; such as a working party arriving in a trench and observed from an elevated observing station; during a calm following a violent fight; during the hot hours of the day, during rain, during dark, silent nights, etc.

The commander of a battery of trench weapons must be constantly on watch and alert; and he must coöperate to the highest degree to give an aggressive attitude to the garrison of a sector during the periods of calm.

Trench weapons may throw either hand grenades or special projectiles.

PART II.

Principles of the Fire of Trench Weapons.

13. *Definitions.*

The *trajectory* is the curve followed by the projectile (Fig. 7).

The *range* is the distance *AB* between the weapon (*A*) and the point of fall (*B*), (Fig. 7).

The *angle of fire* is the angle "a" formed by the direction of the weapon

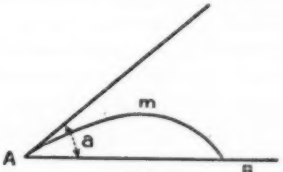


Fig. 7

with AB, which joints the weapon and the target (Fig. 7).

The *angle of site* is the angle which this line makes with the horizontal (Fig. 8).

The *inclination* of the trench weapon

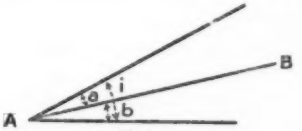


Fig. 8

"i" is the sum of or the difference between the angles of fire and of site, according as *B* is above (Fig. 8) or below (Fig. 9) the horizontal.

The *angle of fall* is the angle that the trajectory makes with the horizontal at

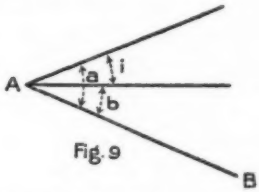


Fig. 9

the point of fall. It is usually slightly greater than the angle of fire.

The *initial velocity* is the velocity of the projectile at the muzzle.

The *plane of defilade* is the plane passing through the upper part of the mask or cover which protects the

emplacement and through the point from which it is desired to be defiladed. Points situated above this plane are visible from the latter point, those below are hidden from it.

14. *Classification of fire.*

According to the angle of fire:

(a) *Direct fire:* Corresponding to a flat trajectory, for which the angle of fire is less than about 15 degrees.

(b) *Plunging fire:* Corresponding to the curved trajectory, for which the angle of fire is greater than 15 degrees.

(c) *Vertical fire:* If the angle of fire is greater than or equal to 45 degrees.

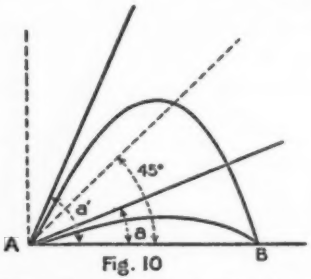


Fig. 10

With a given initial velocity, there are two angles of fire which permit hitting the same target. These two angles of fire, in the case of an angle of site equal to zero, and not taking into account the resistance of the air, correspond to two directions symmetrical with respect to the line at 45 degrees, so that the sum of the two angles is 90 degrees.

Example: If the point *B* (Fig. 10) can be reached from the point *A* with an elevation of 20 degrees, the other angle permitting a hit on the same point with the same initial velocity is 70 degrees. In reality, the movement of the projectile being made through air, a slight correction must be applied to the above rule; this correction depends upon the projectile employed.

According to the direction of fire:

(a) *Direct fire:* Normal to the crest of the hostile entrenchment.

(b) *Oblique fire:* Oblique to the crest of the hostile entrenchment.

(c) *Enfilade fire:* Parallel to the crest of the hostile entrenchment.

(d) *Oblique reverse fire:* Oblique to the crest and coming from the rear.

(e) *Normal reverse fire:* Normal to the crest and coming from the rear.

15. *Classification of Trench Weapons.*—Trench weapons generally use plunging fire; they may be divided into two general classes, viz.:

Of constant initial velocity:

(*a*) Powder charge constant, in the case of mortars.

(*b*) Constant tension of springs, in the case of spring weapons.

(*c*) Constant air pressure, in the case of pneumatic weapons.

Variation in the range is obtained by variation of the angle of fire. As there are two angles of fire that correspond to the same range, the greater of the two is generally used to obtain plunging fire. The variation of the angle is not proportional to the variation of the range. To determine the range, having given the angle of fire, or conversely, the firing table for each weapon is used. This may be in the form of a table from which the range may be read off for any angle; or in the form of a curve, where the abscissæ indicate the ranges and the ordinates the corresponding angles (Fig. 11). Example: The range of 75 meters corresponds to the angles of 20 and 70 degrees.

In this class are included trench weapons which are able to give to the projectiles a limited number of initial velocities, by changes in the charges or pressures. The above rules are applied to each of the initial velocities. The firing tables are of double entry. The

graphical firing tables contain several curves, each corresponding to a well-determined initial velocity.

Of constant angle of fire; the initial velocity is then variable:

(*a*) Powder charge variable.

(*b*) Tension of spring variable.

(*c*) Air pressure variable.

A single initial velocity corresponds then to a given range. It is generally

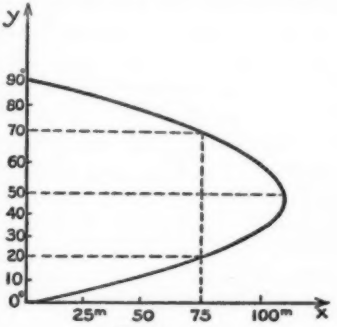


Fig. 11

given by a firing table in tabular form. Weapons of this character generally permit two inclinations: usually 45 degrees and 60 degrees. To each of these inclinations corresponds an initial velocity given by the firing table.

16. *Adjustment of Fire.*—The adjustment of fire consists in finding the elements which cause the projectile to hit the target. It is divided into two operations: adjustment in direction and adjustment in range.

(a) *Adjustment in Direction.*—Trench weapons do not usually have devices for adjustment in direction. A device may be improvised as follows: Trace on the ground, with their intersection directly under the vertical axis of rotation of the weapon, two right lines perpendicular to each other, one of which is parallel to the trench; divide each of the right angles into 16 equal angles (Fig. 12). A peg should be placed at each division at the same distance from the center, and should be numbered from 0 to 32, as indicated in the figure. Each of the angles thus obtained equals one-tenth, *i.e.*, the angle that subtends 10 yards at a distance of 100 yards, or 5 yards at a distance of 50 yards. When the scale is to be used for some time, it should be made on a plank platform.

(b) *Adjustment in Range.*—This is obtained by variation of the angle of fire or of the elements which vary the initial velocity. A constant use of the firing table is necessary. The range is obtained by bracketing the target between two shots, one short, the other long, corresponding to two ranges, slightly different. As trench weapons have short range and are very accurate, a very small bracket may be used, from two to five yards. The chief of the piece or observer must give for each modification the new elements of fire for range (angle of fire, charge, pressure, tension) according to the reading of the firing table.

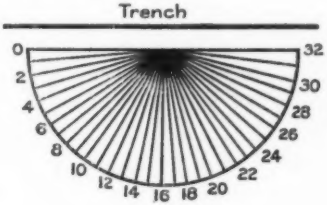


Fig. 12

17. *Principles of observation.*

(a) Observation for Direction.—In order to accurately observe the direction and amount of deviation in azimuth of a shot, the observer must be in the plane of fire of the weapon. If not in this plane, considerable errors may be made, when the error in range is great; as an

error in range may be taken for one in direction.

(b) Observation for Range.—The adjustment of the fire for range depends upon an accurate observation of the points of fall of the projectiles. If the smoke of the explosion hides the target, the range is too short. If the terrain on which the target lies slopes toward the piece, the shot is short or long according as the point of fall is seen under or over the target. When it is difficult to observe errors of range from a point in the plane of fire, these errors must be determined by an observer placed well to one flank of the piece.

PART III.

Destruction of Unexploded Grenades.

18. After each drill in throwing loaded grenades, those that have not burst should be destroyed. If the grenades have time fuses, at least ten minutes should elapse from the time the last grenade was thrown before anyone is allowed on the range to hunt for unexploded grenades. These grenades may then be considered harmless, and they may be gathered and placed in a small pit and exploded with a small charge of high explosive placed in the center of the pile. The detonation can be made more complete by placing several shovelfuls of earth over the pile of grenades. Before the charge is exploded, the personnel should be under shelter.

If the grenades have percussion fuses, it is dangerous to move them, and they should be destroyed with a small charge of high explosive placed in contact with them and covered carefully with a shovelful of earth. In case of a misfire, ten minutes must elapse before the operation is repeated.

It must be absolutely forbidden for anyone to try to unprime unexploded grenades by unscrewing the fuse.

Conclusion.

19. In all sectors of the Western Front in Europe, the grenade throwers have shown great skill and the advantage of thorough instruction.

In one instance, the French succeeded in occupying the entrance of one of the principal avenues of a village; the Germans held the rest. The houses that lined this avenue were practically destroyed; some pieces of the walls alone remained standing. The Germans, skilfully hidden in the shelter of the ruins, had stopped the French charge, and had brought up a field gun and placed it behind a barricade so that it enfiladed the avenue. It was impossible to destroy the gun with artillery, so that grenade throwers were sent forward to destroy it. After two hours of slow and stealthy approach under constant rifle fire, they succeeded with several well-placed grenades in killing the cannoneers just as they were loading the gun, and were able to capture it. The riflemen who followed them were then soon able to capture the rest of the avenue.

During the numerous attacks at Verdun the grenade throwers covered themselves with glory. The engagements inside Fort Douamont were among the most exciting and most tragic of the war. When the details of the fighting at Vaux, Thiamont, and Fluery are known, the great value of the work of the grenade throwers will be appreciated.

A Tactical Walk*

By Captain William H. Waldron, 29th Infantry

An Advance Guard.

GENERAL SITUATION:

The (*a*) [1] forms the boundary between hostile states. A Blue brigade is mobilizing at (*b*). A Red force is assembling at (*c*), and has small detachments of cavalry at various points along the border.

SPECIAL SITUATION: BLUE:

A Blue detachment, consisting of one battalion of infantry and a Machine Gun Company, is in camp for the night (*d*) at (*c*).

At 11.30 A.M. (*f*), Major Z, commanding, decides to march towards (*g*), and issues the following verbal orders to the assembled officers:

The enemy's cavalry has occupied points along the border. Our brigade continues mobilizing at (h).

This detachment will march towards (i).

Captain B, with Company B, will form the advance guard. March at 1.00 P.M., by the (*j*)—(*k*)—(*l*) road.

The remainder of the detachment will follow at a distance of 600 yards in the order, C. D. A, Machine-gun Company.

*This is the third of a series of articles on the subject of Tactical Walks. A new feature has been added which, it is believed, will appeal to officers in their preparation for the conduct of the walk. This is the "Director's Key," placed at the end of the solution and discussion of each situation. It contains the elements to be covered in the solution and discussion of the situation to which it pertains. Officers will find it advantageous to write the contents of the key on cards 3 x 5 inches, and refer to them during the course of the walk. It insures taking up the tactical situations in their proper sequence; and, also, prevents the omission of important elements.

To refresh your memory it may be well to read over the introductions to previous articles regarding the preparation for this class of work.—*Author.*

EXPLANATION OF SYMBOLS.

[1] (*a*)—In designating the boundary line, some natural topographical or geographical feature should be selected, such as a river, creek, canal, crest of a range of hills, etc. In this problem the boundary may be located several marches distant from the point where the problem starts.

(*b*)—The point selected for the mobilization place of the Blue brigade should be in friendly territory, several marches from the border.

(*c*)—The assembly point for the enemy should be in his own territory, two or more marches from the border.

(*d*)—A night is designated by giving the date of the day preceding and of the day following. For example: the night of January 27th would be designated "the night 27/28 Jan." The figures always precede the month.

(*e*)—The point selected for the camp of the battalion. It should be at the place chosen for the beginning of the tactical walk. It may be one or more marches from the feature designated as the border.

(*f*)—The date of the tactical walk should be used here.

(*g*)—Some point situated on the road leading towards the border.

(*h*)—Same point designated in (*b*).

(*i*)—Same point designated in (*g*).

(*j*)—(*k*)—(*l*)—A road is described in field orders by naming several places located thereon. Where a map, with cross-roads numbered, is available, these may be used. For example: The "17-9-11 road" would mean the road passing through the cross-roads numbered 17, 9 and 11. Or, the Fort Leavenworth—Atchison Cross—Frenchman

The outpost will stand relieved when the (*m*) of the advance guard passes the line of resistance, and will join the main body in its proper place.

The field trains will follow without distance.

Messages to head of main body.

On returning from the Officers' assembly, Captain B assembles the non-commissioned officers of his company and issues the following verbal orders for the advance guard:

The enemy's cavalry has occupied points along the border. Our brigade continues mobilizing at (n). Our detachment marches towards (o). The main body follows the advance guard at 600 yards.

This company [2] will form the advance guard.

The first platoon, Sergeant A, will form the advance party. March at 1.00 P.M., via the (*p*)—(*q*)—(*r*) road.

The company (less first platoon) will form the support. Follow the advance party at 400 yards.

The company wagon will join the battalion field trains.

Messages to head of support.

SITUATION, NO. 1.

You, Sergeant A, commanding the first platoon, have been detailed to form the advance party. It is now 12:55 P.M. Your platoon is formed here.

Required:

1. What action are you going to take?
2. What are your instructions to the members of your platoon.

The members of the class are assembled on the (*j*)—(*k*)—(*l*) road (See problem and explanation of symbols), at the point where it is intended that the advance guard formation be taken up.

The Director states that before taking up the problem he desires to make a few remarks on the formation of a column of troops on the march, and to review briefly the formation and duties of an advance guard, as follows:

A column of troops on the march consists of a main body and such covering detachments as may be necessary. These covering detachments are called advance guards, rear guards, and flank guards. They are thrown out to gain information of the enemy; to protect the main body from surprise; and to hold the enemy long enough for the main body to prepare for action.

The advance guard consists of a series of detachments, increasing in size progressively from head to rear, each being charged with the duty of protecting from surprise the body immediately following it, and gaining time for the latter to prepare for action.

The advance guard is normally divided into a support and a reserve. From the support, an advance party is sent to the front a few hundred yards and, from time to time, as the occasion demands, flanking patrols are sent out to the right and left. In a small advance guard, such as we are to consider in this tactical walk, there will be no reserve. To have one would divide the company into too many parts and make it that much more difficult for the captain to handle.

—Kickapoo road," which would mean the road passing the places above designated.

(*m*)—The outpost of a command usually stands relieved when the support of the advance guard passes the line of resistance. The advance guard formation has been taken up and the responsibility for the security of the main body devolves upon the advance guard. This procedure gives the outpost commander a little time to assemble his command, preparatory to falling in his proper place in the column.

(*n*)—Same as indicated in (*b*).

(*o*)—Same as indicated in (*g*).

(*p*)—(*q*)—(*r*)—Same road as that designated in (*j*)—(*k*)—(*l*).

[2] Company B has only one officer (the Captain) for duty with it. The company is organized into four platoons of four squads each.

This is the normal formation. Conditions may change this. It cannot be followed blindly in any case. You must consider your mission, and understand the principles upon which the normal formation is based. Then, use your common sense in meeting the situations that are presented for solution.

Now, let us see what the duties of the advance guard are:

1. To prevent the main body of our troops from being fired into while it is in a formation that prevents it effectively defending itself. You can all imagine what would happen if, suddenly, an effective fire were poured into the company while it is marching in column of squads on the road.

2. To gain information of the enemy by sending out detachments to the front and flanks, at such points as may be necessary. Here is an important point to remember. Under modern conditions of warfare, the haphazard method of sending flanking patrols has every chance of resulting in disaster. These men never get back in time to be of use to you when you need them. Much of this patrolling and marching of flanking detachments across country is exhausting and wears out your troops. It should be reduced to the minimum.

3. To push back small parties of the enemy. The progress of the main body must not be arrested by small, comparatively insignificant detachments of the enemy. It is the duty of the advance guard to brush them aside. How many times at maneuvers have you seen a skilfully-handled patrol make your whole advance guard deploy. It should have been swept away by the advance party. The idea is that you simply have to keep pushing to the front until you encounter something that really stops you.

4. To check an advance of the enemy in force long enough for the main body to prepare for action. When the enemy is met in sufficient force to warrant the employment of troops of the main body, there is a certain process which the commander has to go through before he is prepared to place the command in action. A reconnaissance must be made to determine the strength and disposition of the enemy. It would be folly to commit a force to action without knowing something concerning both. Then, the orders for the deployment have to be issued, and the deployment has to be effected. All of this takes a certain amount of time, during which the advance guard holds off the enemy.

5. To remove obstacles, repair the roads, and favor in every way the uninterrupted progress of the main body.

These are the duties of the advance guard. These are the things that you noncommissioned officers will have to help carry out when your company is on advance-guard duty.

Are there any questions?

The Director will endeavor to answer any questions that may be asked at this time. He then gives a copy of the General and Special situation to each man and allows them a few minutes to read and digest it. He reads the situation aloud, each man following from the copy in his possession.

"Sergeant White give a brief statement of the tactical situation as you understand it," says the Director.

As the sergeant proceeds, the Director will make such explanations as may be necessary. Other members of the class may be required to go over the problem in the same manner. This serves to fix it in their minds and to prevent misunderstandings as the walk progresses. When assured that all are familiar with every phase of the problem, the cards bearing situation No. 1 are given out and the men allowed a few minutes to look them over.

The Director explains to the men that each is now to consider himself as being Sergeant A; that his platoon is there in the road, formed in line, with the right of the line in the direction of the march.

"Sergeant Grant, what is the first thing you would do?" asks the Director.

"I would see if all the members of the platoon are present," replies the Sergeant.

"That is easily done. By looking over the platoon, you see no blank files. Now what are you going to do?"

"It is not quite one o'clock yet. I would have to wait until that time before marching out," says the sergeant.

"You have just come from camp. Have you inspected your men to see if all have their proper equipment?"

"No, sir. I would inspect them now."

"All right. How would you go about it?" asks the Director.

"I would open ranks and then give the command, 'Prepare for Inspection.' I would make the inspection in the usual manner."

"Sergeant Hughes, the inspection has been completed and the ranks have been closed. What would you do now?"

"I would give the command: 'With ball cartridges, Load!'"

"Right. We are now ready for Sergeant A's orders to the platoon. We inspected the platoon and had them load their pieces first because if anything happens to push us out a little ahead of time we can give instructions as we go along. Whenever possible, every man in the command should have some idea of the military situation, so that he may go about his work intelligently. At maneuvers and exercises, this increases interest in the work, and in actual service it is absolutely necessary. Furthermore, some of the men may be called upon to act independently, and the more they know about the situation, the more intelligently they can act. Corporal Smith, what elements must be included in the orders to the platoon?"

Corporal Smith replies, "They ought to know as much as possible about the enemy, and all about what our own troops are going to do. They ought to know the mission of the platoon. They ought to know the formation they are to take, the road they are going to march on, and where to send information."

"Where did you find the model which prescribes the sequence of the order you just stated?" asks the Director.

"In the Field Service Regulations. It is the same for a patrol, the same for a regiment and the same for a division."

"Now, applying these elements and considering the problem, just what information of the enemy and of our own troops would you give them, Corporal Williams?"

"I would tell them about the enemy's cavalry approaching the border. I assume that they already know about our brigade mobilizing at (h). I would tell them that our detachment is going to march in the direction of (o), and that our company is to form the advance guard, with the second, third and fourth platoons in the support, following us at a distance of 400 yards."

"How would you state the mission of the platoon, Corporal Stout?"

"I would say: 'This platoon forms the advance party.'"

"Now comes your disposition of troops: into what parts is an advance party divided, Corporal Wilson?"

"A patrol is sent out to the front. Connecting files march between it and the advance party proper, which follows at about 150 to 200 yards in rear. Flanking parties may be sent out from time to time. These are ordinarily sent from the support."

"What do you call the patrol sent to the front?"

"It is called a Point."

"How many men in a point?"

"Sometimes they have a whole squad,

and at other times they have only four men under a noncommissioned officer."

"How many would you have in this case?"

"I think four men plenty. We never use more men than are necessary. If the advance party were a whole company, a squad would be sent out."

"Sergeant Mason, what other instructions would you give?"

"I would indicate the road that we are to march on, and tell them where to send messages and information; or, tell them where I intend to march, and they will know that that is the place to send information and messages."

Having all these elements in mind, the Director, in order to save time, repeats the order that Sergeant A would give his platoon, as follows:

Enemy cavalry patrols have advanced to points along the border. Our brigade continues mobilizing at (*h*). Our detachment marches this afternoon towards (*o*) via the (*j*)—(*k*)—(*l*) road. Our company forms the advance guard, the company (less this platoon) the support.

This platoon forms the advance party.

Sergeant K (guide), take the rear rank of the first squad and move out as a point. When you arrive at cross-roads and road-forks, flash me W W[3] and I will direct you.

Privates G and H (Nos. 1 and 2 front rank, first squad), will form connecting files between the point and advance party.

Private R (No. 3 front rank), will march with me.

Corporal Y (squad leader 1st squad), will march at the rear of the platoon and watch out for signals from the rear.

I will march at the head of the advance party.

With ball cartridges, load.

At 1.00 P.M., Sergeant A would give the following commands to get his platoon into formation, and start the march:

"First squad, 1. Squad right, 2. March; when the squad had advanced ten paces; 1. Squad, 2. Halt; Sergeant K, take charge and move out with your point; connecting files march at the proper time; others take their places when practicable.

"1. Platoon Right, 2. March. 3. Platoon, 4. Halt; 1. As skirmishers, guide center, 2. March.

"When the rear man of the point has advanced 150 yards to the front, Sergeant A commands: 1. Platoon column, 2. March, and directs the men to march in column of files on each side of the road."[4]

This formation places the platoon in position for rapid deployment to the front, with the squads together and every man in his proper place. Should the enemy appear on the flank, it is only necessary to face the nearest column of files in the direction of the fire to have a formed skirmish line. The ditches usually found along the road side can readily be made available for cover. If the system is once practiced with the company, its advantages will immediately be seen.

The Director will now have several members of the class repeat aloud the orders and commands given by Sergeant A. This is done with a view to drilling the method into their systems so that it will make an everlasting impression.

[3] The signal W W is adapted from Captain Bjornstad's work "Small Problems for Infantry." It means "which way." It can be semaphored in a second and is useful for directing detachments beyond the range of the voice.

[4] Devised by Captain A. J. Dougherty, U. S. Army.

CARD NO. 1.

DIRECTOR'S KEY.

1. Make copies of the problem, one for each man. Prepare copies of the several situations, and write them on 2 x 5-inch cards, one for each man.
2. Conduct the class to a point on the road where the advance guard formation is to be taken up.
3. Give a short talk on the subject of advance guard: (*a*) Formation of a column of troops on the march. (*b*) Description of advance guard. (*c*) Normal division of advance guard. (*d*) Danger of adhering too closely to normal formations. (*e*) Duties of advance guard: 1. Security of main body. 2. Gain information. 3. Push back small parties of the enemy. 4. Check advance of enemy in force. 5. Clear the road, etc. (*f*) Duties of noncommissioned officers with respect to advance guard work.
4. Give out sheets bearing the general and special situations, and the cards bearing Situation No. 1.
5. Question members of class on the situation.
6. Take up solution of Sergeant A: (*a*) Verify members of platoon. (*b*) Inspection. (*c*) Load pieces. (*d*) Tell men the military situation and what the command is going to do. (*e*) Elements to be embodied in the order. (*f*) Questions, to bring out formation of advance party.
7. Repeat orders of Sergeant A:
   1. Information of enemy and our own troops.
   2. Mission of platoon.
   3. Dispositions: (*a*) Point. (*b*) Connecting files. (*c*) Surplus man of squad. (*d*) Corporal Y.
   4. Where march or where messages to be sent.
8. Forming advance guard:
   (*a*) First squad: orders to Sergeant K to move out.
   (*b*) Forming rest of platoon in platoon column.
   (*c*) Moving out.
9. Have members of the class repeat orders following the form laid down in 7—in accordance with the instructions in the Field Service Regulations on the composition of Field Orders.

Note: If there is not room to put all this on one side of the card, use the back for the overflow.

The class is now conducted a few paces along the road, where the cards containing the following situation are given out:

SITUATION NO. 2.

You, Sergeant K, have been designated to command the point, composed of the men of the rear rank of the first squad. They are standing here, ready to move out.

Required: What action do you take?

The Director explains that each man is to now consider himself as being Sergeant K; that his men are waiting and ready to move out; that they have all heard the orders just issued by Sergeant A; that they are familiar with the tactical situation, and the part the company is to play in it; that pieces have been loaded.

The Director here makes a few remarks on the conduct of the point:

The point of the advance guard should lose no time in starting out after it has been ordered to form. In taking up the formation, the first three men to move out should generally do so at an increased gait, slowing down to the regular rate of march when the third man has gotten the proper distance.

The point is nothing more or less than a small combat patrol that has been assigned a definite line of advance, and its operations are conducted on that basis. It may be bold and aggressive because the advance party is following close behind, ready to back it up.

It will be remembered that the outposts are charged with the duty of security until the support has passed the line of resistance, so that Sergeant A has some little distance in which to form his point and get it into operation.

"Corporal Jones, what formation would you give the point?" asks the Director.

"I would use the Boni-point system, having the leading man on the left hand side of the road; then 20 paces in rear of him, the second man would march on the opposite side of the road; twenty paces in rear of the second man, the third man would march on the same side of the road as the first. The rear man would march 20 yards behind the third man, on the side of the road where he can best observe to the rear."

"That is a very good formation. It places whatever cover may be available at the disposal of the men and gives them a very invulnerable formation. Besides, the men marching on opposite sides of the road may be able to see greater distances to the front. This is especially so where the road is winding," remarks the Director.

"As point commander, where would you march?"

"I would not assign a definite place. I would march wherever I could best superintend the operations of the point," answers Corporal Jones.

"Notwithstanding the fact that the men have heard all the instructions of Sergeant A; are familiar with the tactical situation and the part the company is to play in it; are there any other instructions that Sergeant K must give to his men, Sergeant Hughes?"

"Well, sir, I think they know about everything that is necessary," answers the sergeant.

"Suppose something should happen to Sergeant K, who would take command?" asks the Director.

"I had not thought of that. Some man of the point should be designated as second in command."

"Anything else?" queries the Director.

"Not that I know of, sir."

"Can you think of anything, Corporal Williams?"

"Yes, sir. Some one man should be specially detailed to look out for signals from the rear."

"That is exactly the point that I desired to bring out," says the Director. "What is everybody's business is nobody's business and, unless some one man is detailed to look out for this, it will probably not be done. Sergeant K is going to be too busy conducting his point to give this matter consideration."

"Sergeant Cole, you may state the words that Sergeant K would use in instructing the members of the point and putting it in motion. Take into consideration the points that we have just covered."

Sergeant Cole states: "I would call the men to 'attention.' M, you will be second in command. L, you are charged with looking for signals from the rear. The three leading men will move at double time until we get our formation,

then slow down to quick time. N, move out; march on that (left) side of the road (pointing); O, follow at 20 paces on this (right) side of the road; when O has advanced 20 paces, M, move out; march on that (left) side of the road; L, you follow at 20 paces."

"That is a very good solution of the situation," says the Director, then continuing:

I want to call the attention of the members of the class to the manner in which we are working out the details of these situations. It is my desire to have you realize that it is the method you will have to pursue in working out such problems in actual practice. When a noncommissioned officer takes charge of a detachment for any tactical duty and gives his instructions in a clear and concise manner, leaving nothing in the air to be guessed at, he gains the confidence of the men, for they realize immediately that there is someone at the helm who knows his business, and they cheerfully respond. You should practice stating the instructions that you would give under the various tactical situations that you may be called upon to handle, such as an advance party, the point of an advance guard, a flank patrol from an advance guard, an outguard or picket, a sentinel posted from an outguard, a visiting patrol, a reconnoitering patrol, a covering patrol, a combat patrol, and for a detached post. There is no surer way to gain that confidence so necessary to military efficiency.

The Director then inquires, "Are there any questions?"

He endeavors to answer any that may be asked, after which the class proceeds to the consideration of the next situation.

CARD NO. 2.

DIRECTOR'S KEY.

1. Give out card bearing Situation No. 2.
2. Remarks on point of advance guard: (*a*) Starting. (*b*) Combat patrol. (*c*) Outposts furnish security until the advance guard is formed.
3. Formation of point. Remarks on advantages of Boni-point formation.
4. Where Sergeant K marches.
5. Instructions to members of Point. (*a*) Second in command. (*b*) One man watch for signals from rear. (*c*) Remarks.
6. Orders of Sergeant K: (*a*) Attention. (*b*) Second in command. (*c*) Signal observer. (*d*) Formation orders.
7. Remarks: (*a*) Method of solving details of problem. (*b*) Confidence. (*c*) Practice giving instructions to meet small tactical situations.

The Director conducts the class to a point on the road where there is an open space to the front for several hundred yards, with a woods or hedge or some other natural feature where a cavalry patrol of the enemy might locate itself. At this point the class is halted and the cards bearing the following situation are given out:

SITUATION NO. 3.

Your leading man has arrived at this point. You are marching abreast of him on the opposite side of the road. You see a few Red soldiers in the edge of that woods to the left of the road. You observe several led horses back in the woods a little distance. You estimate that there are about six men in the party. They apparently have not seen you.

Required: What action do you take?

The Director reads over the situation, points out the location where the troopers are supposed to be, and directs each member of the class to make a

memorandum on his pad of his solution for the problem. About ten minutes should be allowed for this. When the time is up, several members of the class should be called upon to read their memorandums, after which all are collected and again distributed. Care should be taken to see that no one gets his own memorandum back again. This method is employed for the purpose of creating more interest in the work, for if a man knows that his solution is to be viséd by his comrades he will take more care in its preparation.

The Director states: "The situation has been covered more or less in the memorandums we have just heard. Now, let us take it up in detail and, step by step, arrive at a solution."

"Sergeant White, what would you do?"

"I would open fire at once, sir."

"Tell us just how you would do it."

"N and I would open fire as soon as we saw the enemy. The other men of the point, seeing us do this, would come up and join in the firing."

"How would you handle this situation, Sergeant Hughes?" asks the Director.

"As soon as I saw the enemy I would call to N, 'Down—Enemy in edge of woods.' Then I would signal and call to the rest of the men of the point, 'Double Time.' While they are coming up, I would say 'Target—Enemy in edge of woods—Nine o'clock—Battle sight: Fire at Will.' The command to fire, would be given as soon as all the men had come up on the line, or sooner, if I observed that the enemy was making a move to get away."

"Would you join in the firing yourself?"

"No, sir, I would not. I would have plenty to do to direct the fire of the other men; search the landscape to see if I can discover any other parties of the enemy; and get word of what is happening in front to the advance-party commander," replies Sergeant Hughes.

"What do you think of that solution, Sergeant White?"

"I think it is all right, sir. I can see now why it would be better to get all the rifles into action at the same time, provided the enemy made no move to get away. If he made any move in that direction before all the men were up, I should certainly open fire with all the men who were up at the time. I can also see why Sergeant K would not join in the firing. He will have plenty to do without firing."

"Sergeant Hughes provided for that contingency by stating that he would open if the enemy made any move to get away," says the Director. He adds:

The obvious advantage of waiting until all the rifles are on the line is, that as soon as these cavalrymen are fired into, they will probably break for their horses to make their getaway. There will be only a few seconds in which they will furnish a target. It will take only a moment for all the members of the point to get up on the line. If our point can cause the enemy to suffer enough casualties, they may fall back and not attempt further reconnaissance, especially if the patrol leader is hit. If the leading man of the point opens fire, by the time that the last man gets up the enemy will be well under way and there will be no target. If the cavalrymen return the fire, they at once reveal themselves, and Sergeant K will do well to be seeking out other detachments in the same vicinity. A reconnoitering patrol does not fire on an occasion of this kind, unless it is surprised and is compelled to do so in self defense. By avoiding combat, they have a much better chance of accomplishing their mission of securing information. If this small body opens fire, it may

reasonably be assumed that they are either being backed up by other troops, or have accomplished their mission of finding out the strength and composition of our column, and have turned themselves into a combat patrol, opening fire to delay us or to give information to their own troops that we are advancing in force. If they immediately make a getaway, it will indicate that they are a reconnoitering patrol and that they will probably try to work around the flanks to get information of our main body. As soon as we open fire, they will know that we are not a reconnoitering patrol and that we are closely backed up by other troops.

"Corporal Williams, how would you get word back to Sergeant A, of what is going on in front?"

"I would hold my rifle horizontally over my head to indicate 'enemy in sight, in small numbers.'"

"That would not give Sergeant A much information. When you open fire, he knows that you are firing on an enemy. His common sense tells him that the enemy is in small force. Why not semaphore the information to him?"

"Well, I think that would be better. It would only take a moment, and it would give him some real information," replies Corporal Williams.

"What is the message you would semaphore back, Corporal Edwards?"

"I would simply tell him how many and what kind of troops."

"What I want, are the exact words that you would send," says the Director.

"I would semaphore: 'Eight men. Cavalry.'"

"I think that would give the sergeant all the information that he could reasonably expect under the circumstances."

"Now, let us make a review of the action taken by Sergeant K, under the situation. You may recite it, Sergeant James."

Sergeant James states: "Call to N, Down—Enemy in edge of woods (pointing to left front); kneel myself; call and signal to the other men of the point 'Double Time'; as they come up, command: Target—enemy in edge of woods—nine o'clock—battle sight; when all is ready, or the enemy makes any move to get away: Fire at will; make a hasty examination of the landscape to see if I can locate any other men of the enemy; semaphore to Sergeant A, 'Eight men. Cavalry.'"

The Director states:

You now see the elements involved in this simple situation. You see the responsibility that devolves upon noncommissioned officers when they are placed in the position of Sergeant K. To know what to do and how to do it requires training and close attention to details. Most any of us could go out and blunder through a situation of this kind, but it takes a man trained in military tactics to make his decisions quickly; to act upon them promptly; and take advantage of the fleeting moments to inflict damage on the enemy. These are the things that we study to become proficient in. You cannot put too much time on these phases of your profession. You may know all about your parade-ground drill; you may know all about guard duty and garrison service; these are only mere incidents to the soldier's real job. It is tactics that you must know. What your company commander wants is noncommissioned officers whom he feels confident will meet tactical situations that confront them with judgment and decision. There is no royal road to success along this line. You can acquire this knowledge only through study and actual practice. Are there any questions?

The Director answers any questions that may be asked.

CARD NO. 3.

DIRECTOR'S KEY.

1. Conduct class to suitable point on road.
2. Give out cards containing situation No. 3.
3. Make memoranda of solution on pads. Read some of them. Collect and redistribute.
4. Take up solution in detail: (*a*) First action taken. (*b*) Opening fire. (*c*) Does Sergeant K fire?
5. Estimate of enemy: (*a*) Reconnoitering patrols. (*b*) Combat patrol. (*c*) General discussion.
6. Message to Sergeant A: (*a*) Method of sending. (*b*) Composition.
7. Have members of class repeat solution.
8. Discussion: Training of noncommissioned officers.

The cards bearing the following situation are now given out.

SITUATION NO. 4–a.

As soon as you opened fire, the enemy fell back under the cover of the woods. They did not return the fire. You observe two riderless horses galloping through the woods.

Required: What action do you take?

The Director should announce that the solution to this situation will be made orally. No memorandum will be required.

"Corporal Scott, what would you do now?"

"I would form up my point in the original order of march and move out along the road. We would march at double time until we gained our distance."

"What command, with respect to firing, would you have given the men?"

"I would have signaled, 'Cease Firing.'"

"Anything else?"

"No, sir, not that I know of."

"Would you have given any other command, Corporal Jones?"

"Yes, sir. I would have signaled, 'Cease Firing,' and then followed with, 'Load.'"

The Director should explain that by this time the advance party would have drawn very close to the point and that Sergeant A would probably be sufficiently close to Sergeant K, for the latter to talk to him.

"Sergeant Hughes, what information of the enemy would you give Sergeant A?"

"I would tell him: 'The enemy was a reconnoitering patrol of 8 cavalrymen. They fell back under cover of the woods. I saw two riderless horses in the woods after they withdrew!'"

"What would you do now, Corporal White?"

"I would double-time up to my point."

The class is now conducted some 300 yards to the front where the cards bearing the following situation are given out:

SITUATION NO. 4–b.

Your point has arrived here. Off to the left flank you see six mounted men whom you estimate to be the survivors of the patrol you fired on. They are distant about 1500 yards and moving practically parallel to, and towards, the rear of the main body.

Required: What action do you take?

The Director again explains that the solution will be made orally and that no memorandum will be required.

"Sergeant Hughes, how do you size up the situation now?"

"Well, sir, I assume that the men we now see are members of the force we fired into; that it is a reconnoitering patrol; that they are working around our left flank to get in touch with our column to find out its strength and composition. They are too far away to fire on. I would say that the point has no further concern with them at this time, other than to send information to the advance-party commander regarding the move they have made."

"That is about right," remarks the Director. "Now, Corporal Kennedy, what information would you send back, and how would you send it? I want you to tell me just how you would go about it."

Corporal Kennedy replies: "I would fall back to where Private L is marching. I would say to him: 'You go back to Sergeant K. Tell him that the cavalry patrol which we fired on has withdrawn towards our left flank; that there are probably two dead or wounded cavalrymen in the woods. Point out the place to him. Rejoin the point when you can. As I again moved to the front, I would tell Private M: 'Look out for signals from the rear.'"

The Director explains that the point of an advance guard is not charged with sending out any men to the flank for scouting purposes, that this is done by the advance party or support.

CARD NO. 4.

DIRECTOR'S KEY.

1. Give out cards containing Situation No. 4–a.
2. Announce oral solution.
3. Question members of class: (*a*) Formation of point again. (*b*) Cease firing; load. (*c*) Verbal message to Sergeant A.
4. Give out cards containing Situation No. 4–b.
5. Estimate of situation. (*a*) Cavalry reconnoitering patrol. (*b*) Working around flank.
6. Message to Sergeant A: (*a*) Who takes it. (*b*) Contents. (*c*) Instructions to Private L.

At this point the cards bearing the following situation are given out:

SITUATION NO. 5.

You, Sergeant A, with the advance party, have arrived at this point. Private L delivers Sergeant K's message and points out the place at the edge of the woods where the enemy was located when the point fired on them.

Required: What action do you take?

The Director explains that the members of the class are to now consider themselves again as being Sergeant A, in command of the advance party.

He adds:

There are several elements to be considered by Sergeant A in the solution of this situation. In the first place, he would have sent a verbal message back to the captain relative to the cause of the firing at the front. Then, when the message about the enemy's patrol moving off to the left flank, and the wounded or dead men in the edge of the woods is received, he has to consider what action he would take.

The enemy patrol is evidently endeavoring to work around the left flank with a view to gaining a position where they can observe the march of the main body and determine its strength and composition. Is it the duty of the advance party to try and prevent this? With such a small advance party it can hardly be expected to send out patrols so far to the flanks. It will require a patrol of at least a squad, perhaps two of them, to perform this work, and it had best be left to the support. With

respect to investigating the question of the wounded or dead cavalrymen at the edge of the woods, it is only a short distance from the road, and a small patrol from the advance party may be sent out for this purpose. The next question is: How to get the message about the enemy patrol back to the support commander?

"Sergeant Wilson, how would you get the message back?" asks the Director.

"I would send private L, the messenger from the point, back to the Captain, to give him the message. This will save repeating it to another messenger, with the loss of time incident thereto, and will also eliminate the chance of error due to such a transfer."

"That seems to be the logical course to pursue. We will decide to do it that way. Now, you have practically permanently reduced the point to three men (and a leader). How would you bring it up to the proper strength, Corporal Jones?"

"Sergeant A still has a member of the first squad with him. He would send this man forward to report to Sergeant K for duty with the point."

"Corporal Whyte, how would you arrange for the investigation at the edge of the woods?"

"I would send a small patrol out there."

"Sergeant Hanly, considering all the elements that we have just gone over, you may state the orders that Sergeant A would give to meet the situation."

Sergeant Whyte makes the following solution:

1. To Private L: "You go back to the Captain. Repeat your message to him. Tell him I am sending a patrol to investigate at the edge of the woods where the enemy was fired on."

2. To Private R, the remaining man of the first squad: "You take up an increased gait and join the point when you can. Tell Sergeant K that I have sent L back to the Captain with his message and that I am sending a patrol to the edge of the woods to investigate."

3. To Corporal S, third squad: "You have heard the message just brought back by Private L. Take the front rank of your squad and reconnoiter the edge of that woods. Locate the wounded or dead of the enemy and report the facts in the case to the battalion commander when he comes up. Join the advance party when you can."

"I think these orders cover the situation admirably," says the Director. "We will now proceed to the front where we will take up the next situation for consideration."

CARD NO. 5.

DIRECTOR'S KEY.

1. Give out the cards bearing situation No. 5.

2. Explain that each member of the class is to now consider himself as being Sergeant A.

3. Explain elements of situation and lead up to a solution of the problem by questioning the men: (*a*) Message to captain, reporting firing. (*b*) Action of enemy patrol. (*c*) Sending out patrols from advance party. (*d*) Investigation at edge of woods.

4. Solution: (*a*) Sending message back. (*b*) Patrol to edge of woods. (*c*) Reinforcing point from advance party.

The Director now conducts the class some distance along the road on which the advance guard is supposed to be marching, preferably to a cross road, where the following situation is given out:

SITUATION NO. 6.

You, Sergeant A, have arrived at this point with the advance party. Corporal R's patrol has not yet rejoined. At this moment the signal "Halt," comes from the rear. You halt the advance party. A few minutes later, the first sergeant delivers to you the following message from the captain. "There is no further information of the enemy. The column halts for one hour. The advance guard will form the march outposts. The advance party will form the observation groups. The support will be posted at this cross road. When the advance is resumed, the second platoon will form the advance party. The captain will be at this cross road."

Required. What action do you take?

The Director outlines the elements of the situation as follows:

When a column on the march halts for any considerable length of time, the advance guard continues its covering duty by forming march outposts. These are simply patrols sent out a certain distance to the front, where they halt and remain until they are recalled.

The advance party usually furnishes these patrols. The support is posted at some central point from which it may readily reinforce any group that may be threatened by the enemy.

The patrols cover the routes by which the enemy may approach. In this case it will be necessary to send a patrol to the front on the road on which the column is marching. Another patrol will have to be sent to the (direction, by points of compass, say east) on the road leading from that direction, and another sent to the (direction) west, on the road leading from that direction.

Having these requirements in mind, Sergeant A will consider the men that he has available for the duty. Of the first squad he has the four men of the point, and two connecting files and the squad leader. Of the third squad he has only the rear rank. He has the second and fourth squads intact.

The Director now instructs the members of the class to make a memorandum of their dispositions on their pads. Several minutes is allowed for this, after which the memorandums are collected, several are read, and they are distributed again, being careful to see that no man gets his own back again.

The Director says: "Sergeant Hughes, what force would you send out on the main road to the front?"

"I would detail Sergeant K to command. I would give him the men of the point (4), the connecting files, (2), Corporal Y, of the first squad and the men (4) of the rear rank of the third squad. This would give him a corporal and ten privates, which I should judge would be sufficient."

"What troops would you detail to cover the road leading from the (direction) east, Sergeant James?"

"I would send the second squad intact out there, sir."

"How would you cover the road leading from the (direction) west, Corporal Jones?" asks the Director.

"I would send all of the fourth squad under the squad leader."

"Now," continues the Director, "having all these elements of the problem in mind, each of you make a memorandum of the orders that you would give in the case. What I want is the exact words that Sergeant A would employ on this occasion. Let me remind you of the preliminary sentences before you start to give the orders for the disposition of the troops."

The same procedure as heretofore prescribed will be employed in reading, collecting and distributing the memoranda.

"Now, Sergeant Williams, you may state the order that Sergeant A would give."

Sergeant Williams proceeds:

There is no further information of the enemy. The column will halt for an hour. The advance guard forms the march outpost. The support will be located here.

The advance party will furnish the observation groups.

Corporal Y, take the rear rank of the third squad. Pick up the connecting files and report to Sergeant K for duty. Inform him of the situation. Tell him to post a march outguard covering the main road on which we are marching, about 500 yards from the cross road.

Corporal Z, take your squad and post a march outguard about 500 yards from the cross road on the road leading to the (direction) left. Look out for our own patrols operating in that direction.

Corporal W, take your squad and post a march outguard about 500 yards from the cross roads on the road leading to the (direction) right. Look out for our own patrols operating in that direction.

Send messages to the captain, here.

Move out.

"Corporal Watson, what would Sergeant A do now?"

"I think he would wait here until the captain comes up and inform him of the action he had taken to provide for the security of the column. He would then take Private L, who carried the message back, and go out and visit each of the march outguards, to see if they are properly posted and on the job."

"What would you do with the front rank of the second squad when it comes back?" asks Sergeant Hughes.

"What would you do with it, Corporal Jenkins?"

"I did not consider them in the problem and made no provision for them. If they do return, I would keep them with the support. They have been out on patrol already and there is no telling how much rough marching they have had to do."

The Director replies: "I think that would be a good course to pursue. If they were available, it might be well to give the march outguard on the left flank a little more strength, and they could properly be sent out there."

"Are there any other questions?" asks the Director.

After answering any that may be asked, he continues:

This situation ends this tactical walk. We have considered only a few of the many situations that may present themselves for solution to an advance party commander. I hope you have carefully observed the method of entering into the minute details of the action taken in each instance. It is these details that we slur over in making solutions for tactical problems.

It is in my opinion, by attention to these details, that a noncommissioned officer proves his worth as a field soldier. These are the things that you noncommissioned officers will have to do in campaign. These are the things that you should learn to do in time of peace in order that you may do them instinctively when the time for quick decision and action comes in time of war, and the lives of your comrades depend upon what you do and how you do it. Take for instance that last situation. How many of you would have been able to size up that situation and make the proper dispositions without loss of time and words? How many of you could have given that order in all its details without omitting essential elements? In fine, how many of you could have handled the situation as outlined in the solution? How many of you could handle a similar situation now, with the confidence that you would be doing the right thing? I am sure that all of you could. Herein lies the value of the tactical walk. Concrete problems are presented and, by a system of questions and explanations, a solution

is arrived at on the ground itself. They give you practice in issuing the actual orders that you would issue under the circumstances, and they bring home to you the difficulties that military commanders of all rank encounter in the field. There is no doubt that they form the very best method of learning Minor Tactics. You can not have too many of them. They never get tiresome, for there are an infinite number of situations in any one of them that may be proposed for solution.

CARD NO. 6.

DIRECTOR'S KEY.

1. Give out cards bearing situation No. 6.
2. Outline of elements of situation: (*a*) March outposts. (*b*) Support. (*c*) Advance party. (*d*) Disposition of troops.
3. Make memoranda, collect, read and distribute.
4. Disposition of troops.
5. Make memoranda, etc.
6. Orders: 1. Information of enemy and own troops. 2. Mission of advance party. 3. Disposition of troops. (*a*) To front; (*b*) to left; (*c*) to right. 4. Messages.
7. Action of Sergeant A.
8. Resumé of value of tactical walks as a means of instruction in Minor Tactics.

Bayonet Training

From Authentic Sources

TRAINING in the use of the bayonet is receiving much attention by all the combatant nations in Europe. The aim of the instruction is twofold:

1. To develop great alertness of mind, readiness of muscle, and habit of quick obedience to command.

2. To develop fighting spirit.

Physical drill and bayonet training go hand in hand and their drill periods follow each other. The physical drill consists of calisthenic exercises for fifteen or twenty minutes, followed by some game or exercise requiring great quickness of movement. To accomplish the aims of this training, especially the first named above, it is necessary to execute with snap the movements in the physical drill.

The following is from the latest British Training Manual (1916), which is based on their experience, and the forces are now being trained in accordance therewith:

To attack with the bayonet effectively requires *good direction, strength and quickness* during a state of wild excitement and probably physical exhaustion. The limit of the range of a bayonet is about five feet (measured from the opponent's eyes), but more often the killing is at close quarters, at a range of two feet or less, when troops are struggling corps á corps in trenches or darkness.

The bayonet is essentially an offensive weapon—go straight at an opponent with the point threatening his throat and deliver a thrust wherever an opening presents itself. If no opening is obvious, then create one by beating off the opponent's weapon or making a "feint thrust" in order to make him uncover himself.

Hand-to-hand fighting with the bayonet is individual, which means that a man must think and act for himself and rely on his own resources and skill; but, as in games, he must play as one of a team and not for himself alone. *In a bayonet assault all ranks go forward to kill or be killed, and only those who have developed skill and strength by constant training will be able to kill.*

The spirit of the bayonet must be inculcated into all ranks, so that they go forward with that aggressive determination and confidence of superiority, born of continual practice, without which a bayonet assault will not be effective.

The technical points of bayonet fighting are extremely few and simple: the essence of bayonet training, and continuity of practice.

An important point to be kept in mind in bayonet training is the development of the individual by teaching him to think and act for himself. The simplest means of attaining this is to make men use their brains and eyes to the fullest extent by carrying out the practices, so far as possible, without words of command. This procedure develops individuality and confidence. Alertness and rapidity are qualities to be developed also.

As technique of bayonet fighting is

so simple, long detail is quite unnecessary and makes the work monotonous. All instructions should be carried out on common-sense lines. It should seldom be necessary to give the detail of a "thrust" or "parry" more than two or three times, after which the classes should acquire the correct positions by practice. For this reason, a drill should rarely last more than thirty minutes. It should be remembered that nothing kills interest so easily as monotony.

Progression in bayonet training is regulated by obtaining: first, correct positions and good direction; then, quickness. Strength is the outcome of continual practice.

In order to encourage dash and to gradually strengthen the leg muscles, from the commencement of their training classes should be frequently practised in charging short distances.

All company officers and noncommissioned officers should be taught how

The spirit of the bayonet is to be inculcated by describing the special features of bayonet and hand-to-hand fighting. The men must learn to practise bayonet fighting in the spirit and with the enthusiasm which animate them when training for their games, and to look upon their instructor as a trainer and helper.

Interest in the work is to be created by explaining the reasons for the various positions, the method of handling the rifle and bayonet, and the uses of the thrusts. Questions should be put to the men to find out whether they understand these reasons. When men realize the object of their work, they naturally take a greater interest in it.

to instruct in bayonet fighting, in order that they may be able to teach their men in this very important part of a soldier's training. It should have place in all training schedules, and in all rest periods in war time.

Sacks for dummies should be filled with vertical layers of straw and thin sods, leaves, shavings, etc., in such a way as to give the greatest resistance without injury to the bayonet. A realistic effect, necessitating a strong withdrawal, as if gripped by a bone, is obtained by inserting pieces of hard wood, ¼ inch thick (pieces of crating or boxes), between the stuffing and the sack on the side facing the attacker, and the grain must be vertical.

These sack dummies can be made to stand on end by fixing a wooden cross or star (two or three pieces of wood about two inches broad and ¾ inch thick nailed across one another) in the base of the sack before filling it. They can also be placed with good effect on rough tripods or tied to improvised stools. Dummy sacks should be suspended from gallows and weighted or tethered to the ground from the bottom corners.

By use of a little ingenuity an officer can readily represent the torso of an opponent in positions simulating actual conditions.

The greatest care should be taken that the object representing the opponent and its support should be incapable of injuring the bayonet or butt. Only light sticks (the parrying stick here referred to is shown in plates) must be used for parrying practice.

The chief causes of injury to the bayonet are: insufficient instruction in the bayonet training lessons; failure to withdraw the bayonet clear of the dummy before advancing; and placing the dummies on hard, unprepared ground.

For practising direction, there must always be an aiming mark on the dummy. Cardboard discs for this purpose are desirable. By continually changing the position of the mark, the "life" of the dummies is considerably prolonged.

In the absence of discs, five or six spots or numbers can be painted on the dummies as marks.

Preliminary Bayonet Lessons.

Intervals and distances will be taken as in Infantry Drill Regulations, except that in formations for bayonet exercises the men should be at least six paces apart in every direction. Classes should always work with bayonets fixed.

Before requiring soldiers to take a position or execute a movement for the first time, the instructor shows them the position, explaining essential points, and giving the reasons for them. Then show the position a second time, making the class observe each movement, so that, from the very commencement of the bayonet training, a man is taught to use his eyes and brain. The class is then ordered to assume the position explained and shown. Pick out the man who shows the best position and let the class look at and copy him. Remember that his position may not be ideal, but it is more correct than those assumed by the remainder, who, being beginners, cannot distinguish the difference between a good position and an ideal one. Many instructors err by trying to get a class of beginners to idealize at once.

The recruit course consists of five lessons and the Final Assault Practice.

The men should be accustomed to wear the cartridge belt in the training, and packs may be required to be worn in efficiency tests. For the "thrust" and "parrying" exercises a light stick, 5 feet to 5 feet 6 inches long and ¾ to 1 inch in diameter, must be provided for every two men.

Half an hour a day, at least five days a week, should be devoted to the daily practice in bayonet fighting for trained soldiers. By this daily practice accuracy of direction, quickness, and strength are developed, and a soldier is accustomed to using the bayonet under conditions which approximate to actual fighting. This half-hour should be apportioned to (1) thrusting at the body; (2) thrusting at paper balls on light sticks at varying distances and directions;

(3) parrying light sticks; (4) dummy work; and, when sufficiently proficient, (5) the final assault practice.

LESSON I.

Point of the bayonet directed at the base of the opponent's throat, the rifle held easily and naturally with both hands, the barrel inclined slightly (about 30 degrees) to the left, the right hand at the height of the belt grasping the small of the stock, the left hand holding the rifle at the most convenient position in front of the rear sight, so that the left arm is only slightly bent; *i.e.*, making an angle of about 150 degrees. The legs well separated in a natural position, such as a man walking might adopt on meeting with resistance; *i.e.*, left knee slightly bent, right foot flat on the ground, with toe inclined to the right front.

The position should not be constrained in any way, but be one of aggression, alertness, and readiness to go forward for immediate attack (see Plate I).

COMMON FAULTS.

1. Leaning body back.
2. Left arm too much bent.
3. Right hand held too low and too far back.
4. Rifle grasped too rigidly, restraining all freedom of movement.

Assume the "order" in the easiest way without moving the feet.

"High port." In this position the hands hold the rifle as in guard; the left wrist level with, and directly in front of, the left shoulder; the right hand above the right groin and on level with the belt.

When jumping ditches, surmounting obstacles, etc., this position of the rifle should be approximately maintained

with the left hand alone, leaving the right hand free.

Being in the position of *guard*, to execute "long thrust," grasp the rifle

PLATE I.—"GUARD."

firmly, vigorously deliver the thrust to the full extent of the left arm, butt running alongside and kept close to the right forearm; body inclined forward; left knee well bent; right leg braced, and weight of the body pressed well forward, with the fore part of the right foot, heel raised.

The chief power in a thrust is derived from the right arm with the weight of the body behind it, the left arm being used more to direct the point of the bayonet. The eye must be fixed on the object thrust at. In making thrusts other than straight to the front, the left foot should move in the same direction as that in which the thrust is made. During the later stages of this lesson the men should be practised in stepping forward with the rear foot when delivering the thrust.

COMMON FAULTS.

1. Rifle drawn back before delivering the thrust.
2. Butt of the rifle held as high as or against the right shoulder.
3. The eyes not directed on the object.
4. Left knee not sufficiently bent.
5. Body not thrust sufficiently forward.

REMARKS.

The "long thrust" is made against an opponent at a range of about four to five feet from the attacker's eye.

To withdraw the bayonet after a long thrust has been delivered, draw the rifle straight back until the right hand is well behind the hip and immediately resume the guard. If the leverage or proximity to the object transfixed renders it necessary, the left hand must first be slipped up close to the stacking swivel and, when a pupil has reached that stage of delivering a thrust while advancing on a dummy, he will adopt this method.

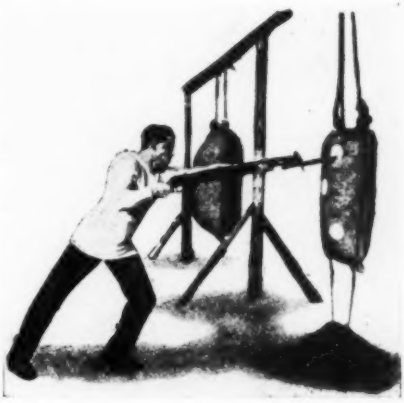


PLATE II.—"LONG THRUST."

After every thrust a rapid "withdrawal," essential to quick work with the bayonet, should be practised before returning to the guard.

PROGRESSION.

First Practice:

Men should always be made to thrust at a target, *e.g.*, at a named part of the body of the opposite man—"At the right eye; thrust, withdraw." Oblique thrusts should be practised by thrusting at the men to the right or left fronts.

As progress is attained, the pause between the thrust and the withdrawal should be shortened, until the men

PLATE III.—"WITHDRAWAL."

reach the stage when they withdraw and come to guard directly after making the thrust, judging their own time. They should be taught to thrust at two or more parts of the body.

To practise action against a retreating foe, first show the position of the kidneys (small of back, either side of the spine).

If possible, the point of the bayonet should be directed against an opponent's throat, especially in hand-to-hand fighting. Other vulnerable and usually exposed parts are on the face, chest, lower abdomen, and thighs, and the region of the kidneys when the back is turned.

Four or six inches penetration is sufficient to incapacitate and allow for a quick withdrawal, whereas if a bayonet is driven home too far, it is often impossible to withdraw it. In such cases, a round should be fired to break the obstruction.

Second Practice:

The class working in pairs, with the instructor supervising, should be practised in thrusting in various directions: (1) at the opposite man's hand, which he places in various positions on and off his body; (2) at thrusting rings, or balls of paper, tied to the end of sticks (see Plates VI, VII, VIII). This practice should be done without word of command, so that the eye and brain may be trained.

Third Practice:

The men will be taught to transfix a disc or number painted on a dummy; first at a distance of about five feet from the dummy, *i.e.* the extreme range of the bayonet; then, after advancing three or more paces. The advance must be made in the most practical and natural way, and should be practised with either foot to the front when the thrust is delivered. The rifle must never be drawn back when making a long thrust in a forward movement. The impetus of the body and the forward stretching of the arms supply sufficient force.

The bayonet must be withdrawn immediately after the thrust has been delivered, and a forward threatening attitude be assumed to the side or beyond the dummy.

Unless the rifle is firmly gripped, it is liable to injure the hand.

To guard against accidents, the men must be at least five feet apart when the practice is carried out collectively.

The principles of this practice will be observed when thrusting at dummies in trenches, standing upright on the ground or suspended on gallows. They

should be applied at first slowly and deliberately, for *no attempt must be made to carry out the final assault practice before the men have been carefully instructed in, and have thoroughly mastered, the preliminary lessons.*

Lesson II.

THE RIGHT AND LEFT PARRY.

From position of guard, vigorously straighten the left arm, without bending the wrist or twisting the rifle in the hand, and force the rifle forward far enough to the right (left) to ward off the adversary's weapon.

The eyes must be kept on the weapon which is being parried.

COMMON FAULTS.

1. Wide sweeping parry with no forward movement in it.

2. Eyes taken off the weapon to be parried.

Men must be taught to regard the parry as part of an offensive movement; namely, of the thrust which would immediately follow it in actual combat. For this reason, as soon as the movements of the parries have been learned, they should always be accompanied with a slight forward movement of the body.

Parries will be practised with the right, as well as with the left, foot forward, preparatory to the practice of parrying when advancing.

First Practice:

Men learning the parries should be made to observe the movements of the rifle carefully, and should not be kept longer at this practice than is necessary for them to understand what is required —that is, vigorous yet controlled action.

Second Practice:

The class works in pairs with scabbards on bayonets, one man thrusting with a stick and the other parrying; the guard is resumed after each parry. At first, this practice must be slow and deliberate, without being allowed to become mechanical, and will be progressively increased in rapidity and vigor. Later a thrust at that part of the body indicated by the opposite man's hand should immediately follow the parry, and, finally, sticks long enough to represent the opponent's weapon in the position of guard should be attached to the dummies and parried before delivering the thrust.

The men must be taught also to parry thrusts made at them: (1) by an opponent in a trench, when they are themselves on the parapet; (2) by an opponent on the parapet, when they are in the trench; and (3) when both are on the same level fighting at close quarters in a deep trench.

Lesson III.

TO EXECUTE THE SHORT THRUST.

Shift the left hand quickly towards the muzzle and draw the rifle back to

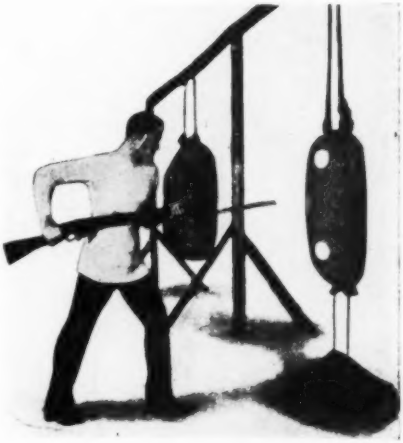


PLATE IV.—"SHORT THRUST."

the full extent of the right arm, the butt either upwards or downwards as a low

or a high thrust is to be made, then deliver the thrust vigorously to the full extent of the left arm.

The short thrust is used at a range of about three feet, and, in close fighting, it is the natural thrust to make when the bayonet has just been withdrawn after a long thrust. If a strong withdrawal is necessary, the right hand should be slipped above the rear sight after the short thrust has been made.

Practice:

The principles of the three practices of Lesson I should be observed so far as they apply. By placing two discs on a dummy, the short thrust should be taught in conjunction with the long thrust, the first disc being transfixed with the latter, the second disc with the former. On delivery of the long thrust, if the left foot is forward, the short thrust would take place with the right foot forward, and *vice versa*.

PLATE V.—"JAB."

Parries will be practised from the position of the short thrust.

Lesson IV.

THE JAB OR UPWARD THRUST.

From the position of short thrust shift the right hand up the rifle and

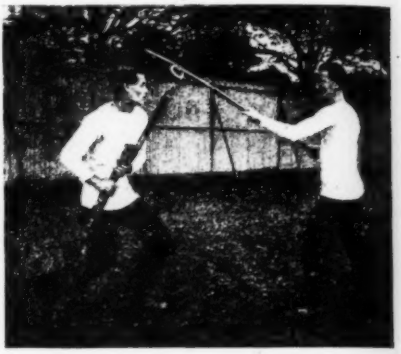


PLATE VI.—"JAB" AT THRUSTING RING.

grasp it above the rear sight, at same time bringing the rifle to an almost vertical position close to the body, and, from this position, bend the knees and jab the point of the bayonet upwards into the throat or under the chin of the opponent.

COMMON FAULTS.

1. Rifle drawn backward and not held vertically enough.
2. Rifle grasped too low with the right hand.

From the jab position men will be practised in fending off an attack made on any part of them by an opponent.

When making a jab from the guard, the right, being the thrusting hand, will be brought up first.

The jab can be employed successfully in close-quarter fighting in narrow trenches and when embraced by an opponent.

Lesson V.

METHODS OF INJURING AN OPPONENT.

It should be impressed upon the class that, although a man's thrust has

missed or has been parried or his bayonet has been broken, he can, as attacker, still maintain his advantage by injuring his opponent in one of the following ways:

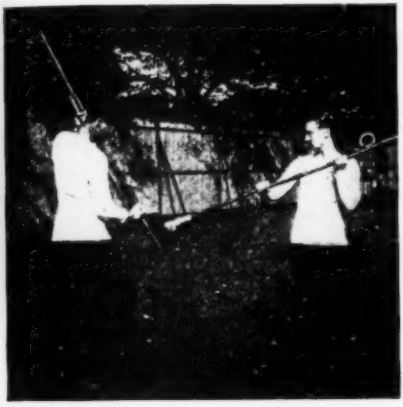


PLATE VII.—"BUTT STROKE I."

Butt Stroke I:

Swing the butt up at the opponent's crotch, ribs, forearm, etc., using a half-arm blow or advancing the rear foot.

Butt Stroke II:

If the opponent jumps back so that the first butt stroke misses, the rifle will come into horizontal position over the left shoulder, butt leading; the attacker will then step in with the rear foot and dash the butt into his opponent's face.

Butt Stroke III:

If the opponent retires still farther out of distance, the attacker again closes up and slashes his bayonet down on his opponent's head or neck.

Butt Stroke IV:

If the thrust has been parried, the butt can be used effectively by crashing it down on the opponent's head with an over-arm blow, advancing the rear foot. When the opponent is out of distance, Butt Stroke III can again be used.

In individual fighting, the butt can also be used horizontally against the opponent's ribs, forearm, etc. This method is impossible in trench fighting or in an attack, owing to the horizontal sweep of the bayonet to the attacker's left.

It should be clearly understood that the butt must not be employed when it is possible to use the bayonet effectively.

Butt Stroke I is essentially a half-arm blow from the shoulder, keeping the elbow rigid, and it can therefore be successfully employed only when the right hand is grasping the rifle at the small of the butt.

Butt strokes can be used only in certain circumstances and positions, but if men acquire absolute control of their weapons under these conditions they will be able to adapt themselves to all other phases of in-fighting. For instance, when a man is gripped by an opponent so that neither the thrust nor the butt can be used, the knee brought up

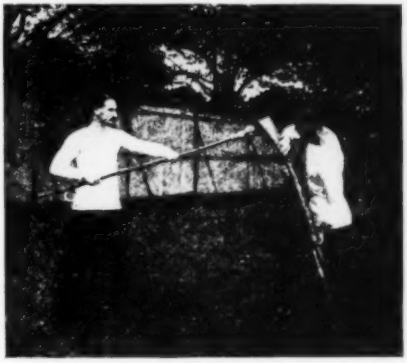


PLATE VIII.—BUTT STROKE IV.

against the crotch or the heel stamped on the instep may momentarily disable him and make him release his hold.

When wrestling, the opponent can be

tripped by forcing his weight on to one leg and kicking that leg away from under him, or any other wrestler's trip; *e.g.*, "back heel."

The above methods will only temporarily disable an enemy, who must be killed with the bayonet, etc.

Practice:

When the classes have been shown the methods of using the butt and the knees, they should be practised on the

"Get after your man, put him out of action by any means at your command."

THE TACTICAL APPLICATION OF THE BAYONET.

A bayonet assault should preferably be made under cover of fire, surprise, or darkness. In these circumstances, the prospect of success is greatest, for a bayonet is useless at any range except hand-to-hand.

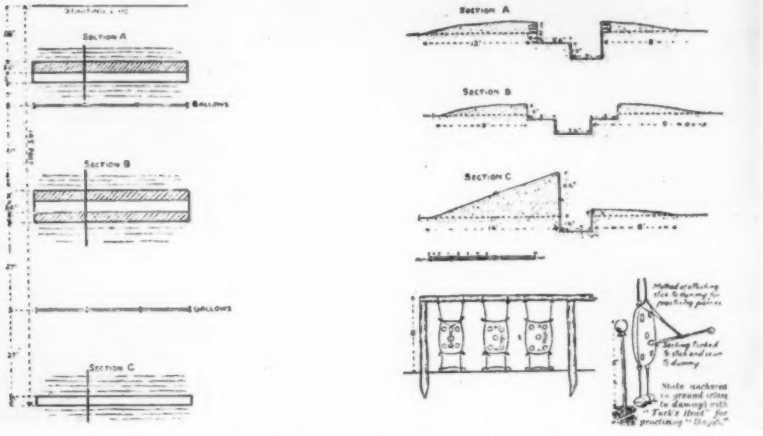


PLATE VIIIA.—TYPE OF SIMPLE "FINAL ASSAULT PRACTICE" COURSE.
It is attacked both ways, and the positions of the trench sack dummies are varied.

padded stick; *e.g.*, fix several discs on a dummy; make a thrust at one; use the knee on another, low down; jab a third, and so on.

Light but still sufficiently-strong dummies should be used for practice with the butt, in order to avoid damage to it.

It is apparent that bayonet fighting as taught for trench warfare abroad lacks all the niceties of the art of bayonet fencing prescribed in our manual. *In bayonet fighting no "fouls" are known. The only rule to follow is:*

At night, all these covers can be utilized. On the other hand, confusion is inherent in fighting by night, consequently the execution of a successful night attack with the bayonet requires considerable and lengthy training. Units should be frequently practised in night work with the bayonet.

The bayonet is essentially a weapon of offense, which must be used with skill and vigor, otherwise it has but little effect. To await passively an opportunity of using the bayonet entails defeat, since an approaching enemy will

merely stand out of bayonet range and shoot down the defenders.

In an assault, the enemy should be killed with the bayonet. Firing should be avoided, for in the mix-up a bullet, after passing through an opponent's body, may kill a friend who happens to be in the line of fire.

FINAL ASSAULT PRACTICE.

This practice is to be carried out only after the men have been thoroughly trained in all the preliminary lessons and have acquired complete control of their weapons, otherwise injury to rifles and bayonets will result from improper application of the methods laid down in the foregoing instruction.

The Final Assault Practice must approximate as nearly as possible to the conditions of actual fighting.

Nervous tension, due to the anticipation of an attack, reacting on the body, as well as the dash across the open and the final dash at the enemy, combine to tire an assaulting party. It is only by their physical fitness and superior skill in the use of the bayonet that they can overcome a comparatively fresh foe.

Therefore, quick aim and good direction of the bayonet when moving rapidly or even when surmounting obstacles, accurate delivery of a thrust of sufficient strength and vigor to penetrate clothing and equipment, the clean withdrawal of the bayonet—which requires no small effort, especially should it be fixed by the bone—are of the greatest importance, and need the same careful attention and constant practice as are devoted to obtaining efficiency with the rifle.

In the Final Assault Practice, the charge brings the men to the first trench in a fairly exhausted condition, and the accuracy of the aim is tested by the disc, which can be perforated only by a true and vigorous thrust and a clean withdrawal.

For this practice, the men should be made to begin the assault from a trench six to seven feet deep, as well as from the open, and they should not cheer until close up to the enemy.

A reproduction of a labyrinth of trenches with dummies in the dugouts, and shelters between the trenches,

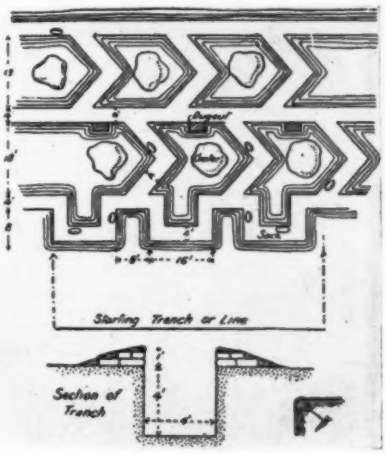


PLATE VIIIB.—EXAMPLE OF SHORT COMMUNICATION TRENCHES.

Which should form part of the usual Final Assault Practice Course, where, owing to the lack of ground, a "labyrinth" for daily practice with the bayonet in the confined space of a trench cannot be constructed within a convenient distance. On arrival in France drafts are tested in trench bayonet work.

forms an excellent Final Assault Practice Course. Assaults should be made from all four sides, in order to give variety. The edges of the trenches should be revetted, otherwise constant use will soon wear them out. Cinders scattered over the course prevent the men from slipping. If gallows can not

be erected, sack dummies should be placed on tripods or on end, as well as lying in trenches, or on parapets, with soft earth free from stones under them. The number, length, and construction of trenches are regulated by the available ground and by the ingenuity of the instructors.

Extremely interesting and practical schemes in trench warfare can be arranged by combining the Final Assault Practice with other branches of training; *e.g.*, bombing, laying sand-bags, entrenching.

Competitions can be arranged by allotting marks for: (1) number of discs transfixed and carried on a bayonet; (2) time taken for signal to charge until the last man of the team passes the finishing post; and (3) form.

Competitions should never be carried out until the men have completed their lessons in bayonet training and thoroughly mastered the handling of the bayonet in the Final Assault Practice.

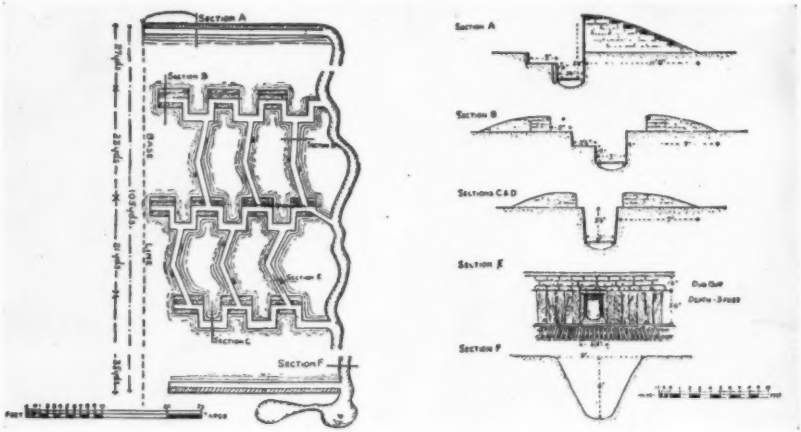


PLATE VIIIC.—TYPE OF "NURSERY" LABYRINTH.

The positions of the sack dummies are frequently changed: The ground between the trenches is pitted with "craters" containing dummies, and the men practised in clearing such "cramped" grounds as well as in clearing the trenches.

Tactical Principles to be Observed During Bayonet Training.

Method of Carrying Rifle With Bayonet Fixed.

QUICK SHORT ADVANCE (IN THE OPEN).

The rifle will be held at the "High Port." This position is suitable for close formation, minimizes risk of accidents when surmounting obstacles, and can be maintained with the left hand alone, allowing free use of the right when necessary.

LONG ADVANCE (CLOSE FORMATION).

The rifle will be slung over the left shoulder, sling to the front and perpendicular to the ground. This is a safe method of carrying the rifle and allowing the free use of both hands.

LONG ADVANCE (OPEN ORDER).

The rifle will be carried at the trail.

The Assault.

The importance of discipline and organized control throughout the conduct of a bayonet assault can not be over-

emphasized. It must be remembered that in this, as in all other military operations, success can be achieved only through the closest coöperation of all concerned; and that, while individual initiative is not to be discouraged, it must be strictly subordinated to the intention of the leader of the assaulting party.

Men should be shown by demonstration that it is in their own interests to pay attention to this point, and that the failure of an enterprise can usually be traced to the lack of this close coöperation.

During training, the following general principles will be observed:

1. All members of the attacking party must leave the trench or rise from cover simultaneously. In addition to the advantages of surprise, needless casualties are thereby avoided.

2. The first stage, especially of a long advance, will be slow and steady—not faster than the pace of the slowest man. Such an advance has a decided moral effect on the enemy, makes certain of the maximum shock at the moment of impact, and at the same time allows the attacking force to reach its objective without undue exhaustion. On the other hand, if the assault is allowed to develop without control and in a haphazard fashion, the moral effect of a steady, resistless wall of men is lost, and the defenders may be given time to dispose of their opponents in detail.

Bayonet control in the attack is just as important and fully as practicable as fire control, and it depends altogether on discipline, which must be taught by close-order work, and on thorough technical instruction in the use of the bayonet. Tactical bayonet control will then follow without much difficulty, provided the instructor has done his work properly.

The actual charge will not be made over a greater distance than twenty paces. Within the last ten yards, and before closing with the enemy, the rifle will be brought to the threatening, yet defensive, guard position. Line will, as far as possible, be maintained until actual contact with the enemy is gained.

As soon as the enemy's position has been carried, and prior to any attack on a further position, or any other operation whatsoever, every precaution must be taken against a counter-attack. In trench warfare, indiscriminate pursuit with the bayonet must never be allowed unless orders to that effect have been given by the leader of the assaulting party. The attacking troops are not so fresh as the enemy, and experience has shown that unorganized pursuit lends itself to ambush and casualties from machine-gun fire. In most cases the work of immediate pursuit is better done by the supporting artillery, the infantry assisting by rapid fire on the retreating enemy.

ASSAULT PRACTICE.

A useful form of Final Assault Practice which can be adapted to a variety of combat exercises is described in following paragraphs. The following materials are assumed:

"A." Communicating trenches leading to a fire trench with an open space in front.

"B." An occupied enemy-trench.

"C." Gallows with dummies, representing the enemy.

(1) retiring from "B" or
(2) coming up in support of "B" or
(3) making a counter-attack on the captured trench "B."

1. The attacking party makes a con-

trolled assault on "A," which is cleared of the enemy.

2. It is then re-formed and an assault is launched on "B," after taking which

3. "C" is regarded in one or other of the above ways, and action taken accordingly.

Throughout the training, men must be constantly practised in:

PLATE IX.—EACH DUMMY MUST BE REGARDED AS AN ACTUAL ARMED OPPONENT.

1. The recognized method of carrying the rifle with bayonet fixed.

2. Rapid advance out of deep trenches.

3. Control and maintenance of line and opening fire during an advance.

4. Using the bayonet with effect in the cramped space of communicating and fire trenches.

5. Re-forming and opening of fire after the assault.

6. Acting as leaders of attacking party.

Instructors should endeavor by every means in their power to arouse the interest and imagination of their men during the assault practice. The special phase of the combat which is to be carried out in the exercise should invariably be explained beforehand. Each dummy must be regarded as an actual armed opponent, and each line of dummies as an enemy line attacking, defending, or retiring, and be disposed of accordingly.

Any tendency toward carelessness or slackness must be instantly checked, and it should be impressed on all ranks that a practice assault which is not carried out with the necessary quickness, vigor, and determination is worse than useless.

Lack of imagination, which allows men and their leaders to violate the most elementary principles of tactics in practice assaults against dummies, can lead only to disaster in a real assault against an enemy.

General Instructions for Bayonet Training Practice.

1. "Guard" "withdrawal," "thrusts," "parries," and the "jab" will be taught first with the left, then with the right foot forward.

2. The position from which the "short thrust" is made is shown in Plate IV. All short thrusts will be practised from this position. Except after a thrust into a dummy, make a momentary pause in this position so as to break men of the habit of drawing

back the rifle from the guard before making the thrust.

3. From the outset squads will be frequently practised in charging for short distances in the open as a strengthening exercise for the legs and a quickening exercise.

4. A target at which to thrust will always be named when working by word of command; it will be indicated by the position of hand when working in class and be clearly marked on all dummies.

5. When working in ranks, the distance apart must be sufficient to avoid all danger of accident when the thrusts are being made. When thrusts have been made advancing, the ranks will change position by coming to the high port, doubling past each other right shoulder to right shoulder and turning about. When working against dummies, men will always continue the movement past the dummy, which they will leave on their right.

6. The "withdrawal," once taught, will be made after each thrust. After a thrust advancing rear foot or on the advance, the hand will always be moved up the rifle, but in the first and second practices, since the arm and body are already stretched to their full extent, and the left hand cannot move farther forward, the hand will be shifted after the withdrawal from the long thrust.

7. All sticks must be padded at one end.

8. In the third practice, the thrusts will also be practised deliberately and progressively on dummies placed, as a preparation for the Final Assault Course, in positions of increasing difficulty; *e.g.*, on parapets and steps of shallow trenches, and in fire and communicating trenches.

9. Scabbards will not be removed from the bayonet except for thrusting at dummies.

PROGRESSIVE PROGRAM OF INSTRUCTION.

1. Intervals, distances, positions.

2. Explain hand-to-hand fighting, and inculcate the spirit of the bayonet.

LESSON I.

3. Guard.

4. Order.

5. High Port.

First practice (in class, by word of command):

6. "Long thrust."

7. "Withdrawal" (*a*) after stationary thrust, (*b*) after thrust, advancing rear foot (Plate III) (first demonstrated by instructor on a dummy).

8. Oblique long thrust.

9. Long thrust, followed by long thrust advancing rear foot.

10. Vulnerable spots explained; region of kidney shown; class practised in making thrusts at these.

Second practice (class working by eye):

11. Long thrust.

12. Long thrust, followed by long thrust advancing rear foot.

13. Varied direct and oblique long thrusts at thrusting ring.

Third practice (thrusting at dummy):

14. Long thrust (Plate II).

15. Long thrust advancing rear foot.

16. Advancing long thrust.

17. Advance long thrust (at two or more dummies).

LESSON II.

18. Explain value of parries; how, in charging, the parry must be strong enough to beat aside opponent's weapon.

First practice (in class, by word of command):

19. Explain, and make the class perform, the movements required for the various parries.

Second practice (class working by eye):

20. Parry stick pointed at the breast.

21. Parry stick pointed at the breast and deliver thrust.

22. Parry stick pointed at head, body, or legs.

23. Parry stick pointed in varying order at head, body, or legs, and deliver thrust.

24. When standing in a trench, parry a thrust made with stick from above.

25. When standing on a parapet, parry a thrust made with stick by a man in trench.

26. With stick parry a thrust made with stick by advancing opponent.

27. With stick parry a thrust made with stick by advancing opponent and come back with a thrust.

28. With stick parry thrust made with stick lightly held in one hand by charging opponent. (By holding his stick in right or left hand the attacker will clearly show on which side he is thrusting, and he will pass on that flank.)

Third practice (pointing at dummy with stick representing opponent's weapon):

29. Advance, parry stick, and thrust.

Lesson III.

30. Demonstrate the short thrust and explain when it is used (Plate V).

First practice (in class, by word of command):

31. Short thrust.

32. Withdrawal: (*a*) stationary; (*b*) advancing rear foot. (Demonstrated by instructor on dummy.)

33. Oblique short thrust.

34. Short point advancing rear foot.

35. Long thrust advancing rear foot, followed by short thrust advancing rear foot.

Second practice (class working by eye):

36. Short thrust.

37. Short thrust advancing rear foot.

38. Long thrust advancing rear foot, followed by short thrust advancing rear foot.

39. Varied direct and oblique long and short thrusts at thrusting ring.

40. Practise various parries, parries and thrusts, from short thrust position (Plate IV.)

Third practice (thrusting at dummy):

41. Short thrust.

42. Short thrust advancing rear foot.

43. Long thrust advancing rear foot; short thrust advancing rear foot.

44. Advance, long thrust, short thrust (at two dummies in suitable positions).

Lesson IV.

45. Demonstrate jab at dummy; then, by placing men of the squad in suitable positions, explain when and how it is used in conjunction with thrusts (Plate V).

First practice (in class, by word of command):

46. Jab from jab position.

47. Short thrust advancing rear foot, jab advancing rear foot.

48. Long thrust advancing rear foot, jab advancing rear foot.

49. Long thrust advancing rear foot, short thrust advancing rear foot, jab advancing rear foot.

50. Short thrust advancing rear foot, jab advancing rear foot, long thrust advancing rear foot.

Second practice (class working by eye):

51. Jab at thrusting ring (Plate VI).

52. Direct and oblique long and short thrusts, and jabs in varying order, at thrusting ring.

53. When in jab position, ward off high and low thrusts made with stick.

Third practice (thrusting at dummy):

54. Jab from jab position.

55. Short thrust advancing rear foot, and jab advancing rear foot.

56. Long thrust advancing rear foot, short thrust advancing rear foot, and jab advancing rear foot (at dummies).

57. Advance, long thrust, and jab.

58. Advance, long thrust, short thrust, and two or more jabs (at dummies.)

LESSON V.

First practice (word of command):

59. Practise Butt Stroke I.

60. Practise Butt Stroke II.

61. Practise Butt Stroke III.

62. Practise Butt Stroke IV.

Second practice (working by eye):

63. Butt Stroke I at padded stick (Plate VII).

64. Butt Stroke II at padded stick.

65. Butt Stroke III at padded stick.

66. Butt Stroke IV at padded stick (Plate VIII).

68. Long thrusts, short thrusts, and jabs at thrusting ring, with butt strokes at padded stick, varied.

69. Trips practised by men working in pairs.

Third practice (on dummy):

70. Thrust, jab, etc., at dummies, followed by Butt Strokes I to IV at light dummies, and introducing kicks and any other form of in-fighting.

A GUIDE FOR THE TRAINED SOLDIER'S DAILY PRACTICE.
(30 MINUTES.)

(1) 5 minutes.

(*a*) Long thrust at hand (11-12 Progressive Program of Instruction) (not more than 8 thrusts each man).

(*b*) Short thrusts (36, 37, 38, Progressive Program of Instruction) (not more than 10 thrusts each man).

(2) 5 minutes, steady advance over obstacles and charge 20 yards, about 100 yards in all.

(3) 4 minutes, parrying stick and thrusting (23 Progressive Program of Instruction).

(4) 4 minutes, butt strokes, each stroke twice (59, 60, 61, 62, Progressive Program of Instruction) or practise trips, etc. (69, Progressive Program of Instruction).

(5) 6 minutes, long thrusts, short thrusts and jabs at thrusting ring, with butt strokes at pad stick, varied (68, Progressive Program of Instruction).

(6) 6 minutes, Final Assault Practice.

A Trench Rifle

By Albert Marple

A NOVEL type of firearm, which promises to play an important part in trench warfare, has just made its appearance in the western part of this country. This apparatus has been invented jointly by L. L. Richards and S. A. Guiberson, of Los Angeles, Calif., and has been given the name of "the altiscope rifle." At a series of tests held recently on the government range at Beverly Hills, Calif., it was conclusively demonstrated that it is possible to use this new type of rifle with perfect accuracy, while the operator's head is at least a foot below the top of the trench. In other words, while the marksman is crouched behind the breastwork, with no part of his anatomy exposed to the view of anyone at the opposite side of the trench, it is an easy matter for him to hit objects the size of a man's head at distances ranging from 200 to 400 yards, and to do this as effectively as it may be done with the ordinary rifle—with the marksman's head above the top of the trench. The action of this rifle is very similar to that of the submarine, the firing being done after the aim has been found through a system of reflecting lenses.

To work out their theories, the inventors took the modern Springfield rifle, such as is used in the United States Army, and into this they fashioned a frame of steel, by which it is possible to raise or lower the barrel. They also added reflecting lenses and mirrors which permit the marksman, while holding the butt of the rifle in the customary manner against the shoulder, to get the aim through the sights of the elevated barrel. In this way the barrel of the rifle projects over the top of the trench, while the marksman remains fully concealed from the opposing force. The sight of the target or enemy, after passing through the two sights with which

FIG. 1.

the modern army rifle is equipped, is caught by the small, round, elevated reflector, which extends an inch or so above the top of the trench.

From this a view of the country at

the opposite side of the breastwork is shot down through a hole in the movable part of the stock and is again caught, this time by a small reflector, or

FIG. 2.

mirror, located just below this movable section, when it is open.

The altiscope rifle, under ordinary circumstances, is in the form of a regular firearm, and may be used, when desired, as such. To change it from this regular type of rifle to the elevated trench arm, a safety button, located at the side of the stock, is pressed with the finger of the left hand, while with the right the elevating handle is raised, this resulting in the magazine, the rear end of the barrel, and a portion of the stock being drawn upward. Of this movable section of the stock, one end is hinged to the rear end of the magazine mechanism, while the other runs in a track or groove in the lower or main section of the stock. Upon reaching the desired position for trench use, the rifle automatically locks itself and cannot be changed by jar, recoil, or the like—only the pressing of the release button changes it, when it drops in the position for regular rifle work or bayonetting.

This elevated firing is made possible by a frame and mechanism which are made of pressed steel, and adds not more than a pound and a half to the weight of the regular firearm. When open, this rifle is just as rigid and "handy" as the ordinary gun, and its value for trench fighting, for which it has been invented, may be seen at a glance. It is claimed that when manufactured in quantities the cost of the altiscope rifle will not be more than two dollars above the cost of the regular firearm in connection with which it is used. The change from one type of rifle to the other may be made in less than five seconds, and, after the change has been effected, the speed and accuracy of firing are, under identical conditions, equal to the work possible with the type of rifle that is now in use. It is as easy to learn to shoot accurately with the altiscope rifle as with the ordinary firearm.

FIG. 3.

This rifle was tested out by United States Army officials at Springfield, Mass., and so successful was the test that the government appropriated funds for its perfection.

A Syllabus
of
A Canadian Training School for Officers

By a Special Correspondent

1. Duties and Responsibility of an Officer.

(*a*) Importance of subject.
(*b*) Mutual confidence.
(*c*) Personal responsibility.
(*d*) Avoidance of playing to gallery.
(*e*) Loyalty.
(*f*) Relationship between officers and men.
(*g*) Contrast with civilian life.—2 hours L.[1]

2. Leadership.

(*a*) Its meaning.
(*b*) How to acquire the art of.—1 hour L.

3. Discipline.

(*a*) General behavior and conduct of officers.
(*b*) Personal appearance—physical fitness—punctuality—saluting.—2 hours L.

4. Morale.

Its meaning and importance—Responsibility of officers and N.C.Os. regarding it—Patriotism—Esprit de Corps—Esprit de Brigade—Esprit de Division—Esprit d'Armee. Creation of Canadian Esprit de Corps.—1 hour L.

5. Organization.

Battalion—Brigade—Division—Chain of responsibility.—2 hours L.

6. Care of Arms.

Rifles—Bayonets—Ammunition—Equipment—Smoke Helmets—Clothing.—1 hour L.
Iron Rations.—5 hours P.[2]

7. Drill.

(*a*) Importance of as means to an end.
(*b*) Squad with arms.
(*c*) Platoon.
(*d*) Company.
(*e*) Battalion.—45 hours P.

8. Physical Training.

(*a*) Bayonet fighting.—2 hours L., 30 hours P.
(*b*) Physical training.—27 hours P.

9. Duties of Platoon and Section Commanders.

In camp, bivouac, and billets.
(*a*) System of billeting.
(*b*) Line of march (discipline).
(*c*) In the trenches.
(*d*) In the attack (as carried out by the lately adopted platoon formation).—2 hours L.

10. Protection.

Advanced Guard, Rear, Flank, and Outposts.—1 hour L.

11. Principles of Attack Normal.

(*a*) Organization previous to.
(*b*) Distribution of troops.
(*c*) Formation with regard to ground.

[1] Lecture.
[2] Practical.

(*d*) Formation with regard to fire.
(*e*) Close communication with the troops on the flanks.—4 hours 1 L. 4 hours 3 P.

12. Trench Orders.

(*a*) Absolute necessity for.
(*b*) Organization of work.
(*c*) Allotment of hours for watch, work, meals, etc.—1 hour L.

13. Trench Warfare.

(*a*) Organization for an attack from the trenches (using new platoon formation).—8 hours 2 L.
(*b*) Supply of ammunition, grenades, rations, water.—6 P.

14. Fire Discipline (combined with care of arms).

(*a*) Combination of fire with movement.
(*b*) Fire control.
(*c*) Description of targets.—3 hours 1 L.
(*d*) Judging distances.—4 P.
(*e*) Use of range finders.

15. Defence Normal.

(*a*) Principal lines of defense.
(*b*) Taking up a defensive line.
(*c*) Siting of trenches by day and night.
(*d*) Telling off and distributing of working parties.—6 hours 2 L. 4 P.

16. Defence.

(*a*) Construction of trenches.
(*b*) Construction of parapets.
(*c*) Construction of traverses.
(*d*) Revetting, sandbag, fascine, wire hurdle, and other expedients.
(*e*) Construction of splinter proof.
(*f*) Loopholes, siting and construction of.
(*g*) Sniping posts.
(*h*) Listening posts.
(*i*) Sapping, principles of.—40 hours 4 L.
(*j*) Entrenching tools, use of.—36 P.
(*k*) Entanglements.
(*l*) Use of telescopes and periscopes.
(*m*) Sniping, use and methods to be employed in.

17. Machine Guns.

(*a*) How to fire the Lewis gun.
(*b*) Principles of employment in attack and defense.—1 hour L.

18. Grenades.

(*a*) Description of.
(*b*) Handling of.
(*c*) Limitations of.
(*d*) Use in attack and defense.
(*e*) Training of bombers.
(*f*) Organization of bombers in attack.
Organization of bombers in defense.
(*g*) Carrying of.—5 hours 3 P.
(*h*) Supply of.—2 L.

19. Patrol Work.

(*a*) Importance of.—2 hours 1 L.
(*b*) How to organize.—1 P.

20. Map Reading.

(*a*) Simple scales and meaning of.
(*b*) How to read a map (explain how it should be looked upon as a book and not as a puzzle).
(*c*) System of squaring and how to read.
(*d*) Compass, variation of, taking of angles. Conversion of magnetic into true-bearing.—12 hours 5 L.
(*e*) Setting a map by compass and by other methods.—7 P.

21. Messages and Reports.

(*a*) Official letters and writing of.
(*b*) Memoranda.
(*c*) Minutes.
(*d*) Field messages, methods of writing.
(*e*) Verbal messages, limitations of.
(*f*) Reports, how to be written.
(*g*) Reconnaissance, simple form of.—8 hours 2 L.
(*h*) Trench reports.—6 P.

22. Coöperation of Other Arms.

(*a*) Importance of and methods of.
(*b*) Coöperation between staff and regimental officers.—3 hours L.
(*c*) Coöperation with Artillery.
(*d*) Coöperation with Engineers.

23. Arrest.

(*a*) Rules for.
(*b*) Telling off and disposal of prisoners.
(*c*) Crimes and punishment on active service.
(*d*) Field General courts-martial.—2 hours L.
(*e*) Army (suspension of sentences) Act, 1915.

24. Intelligence.

(*a*) Service of security.
(*b*) Information.
(*c*) Prisoners of war.
(*d*) Treatment and disposal.—1 hour L.

25. G.R.O.

Extracts from secrecy press, discipline, correspondence, etc.—1 hour L.

26. System of Supply.

(*a*) Ammunition.
(*b*) Supplies.—1 hour L.

27. Billet Life.

How to care for and get the best out of the men in billets. *N.B.*—This is a special subject with a very special importance, which was not realized at the commencement of the war.—1 hour L.

28. Sanitation.

(*a*) In trenches, billets, bivouac, line of march.
(*b*) Care of feet, standing orders on the subject.
(*c*) Evacuation of the wounded, general principles of.
(*d*) First aid, use of field dressing.—2 hours L.

29. Gas.

(*a*) Protection against.
(*b*) Attack with.—1 hour L.

30. Revolver.

(*a*) Method of using.
(*b*) Short course in use of.—3 hours P.

Average Day.

6.45– 7.30—Physical Drill.
9.00–10.15—Drill.
10.30–11.30—Lecture.
11.30–12.30—Bayonet Fighting.
2.00– 4.00—Engineering (Practical).
6.00– 7.00—Lecture.

Foreign Machine-Gun Doctrine

Study by School of Musketry, Fort Sill

FROM sources that are considered reliable, it has been learned that our doctrine in regard to machine guns has not kept pace with the experience of the European conflict to date (1917).

Prior to the present war, it had been the practice to consider all automatic small arms in a single class.

The United States was not alone in this practice and, predicating its judgment upon the specious fallacy that any automatic fire-arm using infantry ammunition was a "machine-gun," our Government, among others, entered upon the deceiving pursuit of "*the best* machine gun."

Two Classes of Guns.

Those best qualified to speak on machine-gun matters on the continent of Europe to-day agree that automatic small arms are of two distinct classes. These two classes are termed first, machine guns, and second, automatic rifles or machine rifles. The distinguishing characteristic of the machine gun proper is its ability to continue its fire for long periods of time. This characteristic is found only in guns of the water-cooled variety and hence the term "machine gun" is used only in reference to guns of the type of which the Maxim and Vickers are familiar examples. Guns not possessing this quality of long-sustained fire action are termed automatic rifles. An example of this type of weapon is our present Benét-Mercier machine rifle, as are also the Colt, Lewis, Hotchkiss and other varieties of air cooled guns.[1]

As the characteristics of these two distinct types of automatic weapons are quite different, so is their tactical employment, as well as the organization of the personnel to handle them.

In the use of both types, there appears to be a tendency to drift away from the old idea of the automatic arm being only a weapon of opportunity or emergency. This change of view doubtless has come about because of improvements in mechanism and in organization. Where formerly the guns were few in number and quite liable to malfunction, they are now more reliable in their action and, in some instances, have been increased in numbers by as much as 1,000 per cent. With such masses of guns in use, the accidental stoppage of a single gun would be of little moment, whereas, with but two or four guns to the regiment, the loss of the fire of a single gun was a serious matter.

Organization and Armament.

The tendency to-day is to arm the regiments with the "automatic rifle," the units handling these rifles being integral parts of the regiments to which they pertain, as in our own service. In addition to these regimental guns, the practice is to employ the "machine-gun" units practically as a fourth combatant arm. These machine-gun units pertain to brigade or division organizations, or

[1] In Great Britain, all such guns, as a class, are called "Lewis Guns."

both, with a constant tendency toward a concentration of control of all the machine guns of a division in the hands of a single officer acting directly under the orders of the division commander.

It is true that certain regiments are still armed with the old Maxim gun, but it appears that this is from necessity rather than choice.

The regimental units vary as to the number of automatic rifles prescribed in their organization. Sixteen automatic rifles per thousand infantry is the maximum that has been noted. However, in the absence of stern repressive measures, the men are prone to add to this number. Instances have been noted in which they even went so far as to improvise means of transportation for guns captured from the enemy in order that they might not be obliged to leave them behind.

The number of "machine guns" pertaining to brigade and division organizations varies from 2 to 7 guns per 1000 infantry. Here again it appears that the smaller number comes from necessity rather than choice.

Thus it is seen that the total number of guns, machine guns and automatic rifles together, will come normally to over twenty of these weapons per thousand infantry. It is learned from authentic sources that, on some portions of the European front, the aggregate of such guns is as high as 69 per 1000 infantry.

Our Doctrine Obsolete.

In the light of recent European experience in war, therefore, it would appear that our own machine-gun doctrine is in need of revision. Based on the ratios given above, this would give our infantry regiment about 20 automatic rifles on a peace basis, and about 30 on a war basis. In addition to this, there would be a single divisional unit, properly subdivided, of 72 machine guns on a peace footing, and 108 on a war footing. This would make a total for the division, exclusive of the divisional cavalry, of 270 automatic rifles and 108 machine guns in place of 36 automatic rifles and *no* machine guns prescribed by our present doctrine.

It is not to be understood from these figures that the School of Musketry advocates this as the proper organization for our infantry machine-gun and automatic-rifle service. It is nothing more than an estimate of what that service would be were it organized along the lines of the best European thought of to-day. As there is a constant tendency to add more and more of these guns, the near future doubtless will prove this estimate to err on the side of ultra conservatism.

There are at hand no reliable data on which to base an estimate of what our cavalry machine-gun service would be if organized along present European lines.

It does not appear that machine-gun or automatic-rifle units have been attached to artillery organizations by any of the belligerents.

There is still another class of machine-gun unit besides the infantry and cavalry regimental and divisional guns. Reliable reports are lacking as to the organization and tactical employment of this third class of guns. It is known only that such units exist and that they are given the most mobile transport that can be used in the country in which they are operating—this means motor vehicles of some class when the state of the roads is such as to permit their use. It is assumed that their tactical use is as an extremely mobile reserve of firepower in the hands of the higher com-

manders. In this capacity, it is easy to conceive of their effective employment in the holding of advanced positions until their occupation is made good by other troops; in giving quick support to a hard pressed portion of a defensive line; in pursuit of a retreating enemy and in delaying and rear guard actions. It must be borne in mind, however, that this is mere surmise and may not be at all in accord with the facts when they are brought to light.

Tactical Use of Infantry Guns.

REGIMENTAL AUTOMATIC RIFLES.

The following points are noted:

Never lose sight of the fact that the weapon is an automatic rifle and not a machine gun. One thousand cartridges is about the limit of its continuous fire without the probability of serious jams.

It cannot be used for indirect or overhead fire.

It is essentially an offensive weapon and is associated closely with the infantry firing line.

It is extremely mobile, and advantage is taken of this mobility to provide alternative positions for its use.

Its crew must be specially selected men of a high degree of training and should be composed of intelligent marksmen of more than average physique.

In the attack, the automatic rifles engage hostile machine guns that have not been destroyed by the artillery preparation; prevent the enemy from firing effectively in case the assault is repulsed; and defend the new position against counter-attack if the assault is successful.

In defense, the automatic rifles are posted in such manner as to cover all the ground in front of the trenches that is not covered by the machine guns. This would include mine craters and even the slightest depressions that might afford shelter to the enemy. Their positions are carefully masked from the front, their habitual use for enfilade fire making concealment easier.

DIVISIONAL MACHINE GUNS.

The rôle of the machine gun appears to be a defensive one. The infantry gains the ground, the machine gun holds it.

It is held that the infantry of a division must be free to maneuver. It cannot do this if held down to the duty of defending given fronts. The divisional machine guns, therefore, with a small support of riflemen and grenadiers, are assigned to the duty of defense, thus leaving the bulk of the infantry free to carry out such maneuvers as the situation demands.

For this machine-gun defense to be effective, the control of the guns must be with the division rather than in any brigade or regiment. The defense then can be carried out with a singleness of purpose; whereas, were the guns scattered in small independent groups, local needs would appear of such great import as to jeopardize the successful defense of the front as a whole.

Machine guns then, with the aid of barbed wire, grenadiers and a small support of riflemen, become the backbone of the defense. A position so held also becomes the foothold from which the attack is launched.

When infantry holds the first line of trenches, the machine gun gives place to the automatic rifle and becomes, forthwith, a "second line gun." The function of the machine gun as a second line gun is to use its fire as a barrier or curtain through which the enemy must pass

in order to reach the first line of trenches; to have emplacements so situated that it can enfilade its own first line trenches should the enemy succeed in gaining them and to make its own capture so costly that its infantry will have time to prepare for stubborn defense against the further advance of the enemy.

INDIRECT FIRE.

The divisional gun, the machine gun, has been used with good results for indirect and overhead fire. The automatic rifle is considered unsuitable for indirect fire and unsafe for overhead fire.

Numerous cases are cited in which baggage trains, supply and ammunition columns, reliefs for the fire trenches, etc., have suffered serious losses from the enemy's indirect machine-gun fire.

One division commander is quoted as stating that he estimates a reduction in his casualties of over sixty per cent due to the fact that the enemy was kept down and prevented from firing accurately by the indirect fire of the machine-guns.

Training and Discipline Essential to Success

Observations From the Present War

A FEW timely comments by an officer who has been at the front in the present war are given below:

1. New troops and young drafts have proved themselves gallant in the forward rush, when they are told exactly what to do, but they fail and are beaten back more often than they ought to be when they find themselves left out in front and are on their own responsibility.

This is due first, to want of knowledge of what to do on the part of officers and noncommissioned officers, and second, to want of discipline which finally means their inability to "stick to the job."

As regards the first, want of knowledge can only be supplied by all senior officers taking every opportunity to talk with the young officers in the trenches, as well as at training camp, asking them how they would act in certain situations and discussing military questions with them.

As regards the second, want of discipline must be corrected by officers and noncommissioned officers insisting at all times that orders be obeyed promptly and in the proper spirit; that men are quick and alert at all times whether on or off duty.

A soldierly bearing should be insisted upon at all times. The men must constantly be instructed that the foundation upon which discipline rests is that of a very high sense of duty. Officers and men promptly obey their superiors, not because they fear them, but because it is their duty. All must recognize that without this high sense of duty and its logical consequence, discipline, troops will never stand and endure all they must face if victory is to be theirs. Another means of maintaining discipline, especially in the trenches is to keep the men busy. The officers on their part should do everything for the security and comfort of their men. They must issue the necessary orders and insist on those orders being carried out cheerfully and with energy. Officers must show initiative; this can only come from confidence in one's self and the possession of moral courage.

2. During recent fighting two failures were noticed:

(*a*) Officers became so absorbed in themselves, and in their own local situation, that they failed to keep others and their superiors constantly informed of what was going on. Steps were not taken to improve the position or to inform superiors at once of what was required by the situation.

(*b*) Officers accepted orders which local circumstances made impossible, and yet, knowing that they were impossible, they tried to carry them out, resulting in failure, and in the great discouragement of the troops. Higher commanders must be informed of the true state of affairs.

3. With reference to tactics: Once the attack is launched it must be carried out with rapidity, energy and

resolution. But, if the attack must be rapid, the preparation must be thorough, which requires time. This preparation must aim to fulfil the following conditions:

(*a*) There must be a thorough, systematic and controlled artillery bombardment. For this, close touch with forward observing officers is necessary.

(*b*) Assaulting lines must be formed up parallel to the objective, and in depth, otherwise there will be confusion, hesitation, etc.

Proper trenches must, therefore, be dug, and this requires time—probably some days.

(*c*) Cohesion and resolution are necessary. To gain cohesion, all men of the assaulting lines must climb out of the trenches simultaneously, and advance together, otherwise there will be confusion, hesitation and an advance of a few isolated men followed by groups of other isolated men. There must therefore be sufficient ladders for every man. A single line is very seldom sufficient for an assault; there must be at least two lines for night attacks, at least three lines for day attacks, and it will often be better to have four or five lines, dependent on the depth to which it is intended to push the attack.

4. The question of command: Commanders must not throw all responsibility on to juniors. Senior commanders must see to all preparations themselves and they must organize accordingly. To simply order a junior "to attack," leaving all preparations and organization to him, is most unfair. If senior commanders make the mistake of merely passing orders on to subordinates, and take no steps to organize and fail to make the preparation possible with all means at their disposal, one would see again what has been seen in the past, an attack of a division degenerating into the isolated advance and sacrifice of one company.

How can a commanding officer ensure time for the following preparations, obtain the tools, etc.:

(*a*) To dig the requisite trenches.

(*b*) To provide and put up ladders.

(*c*) To make bomb stores, and fill up these with reserve bombs.

(*d*) Provide enough bombers for all the trenches that require dealing with.

(*e*) Provide reserve bombers.

(*f*) Arrange for digging communication trenches.

(*g*) Arrange for covering fire from rifles, machine guns and trench mortars.

These are all matters which require the particular attention of the staff and senior commanders.

Senior commanders cannot be too careful or too thorough in seeing to every item in the preparations of an attack, if they are to ensure success and gain or retain the confidence of their own men.

Varied Ground

Organization of the French Infantry.

The French infantry company, as at present organized, comprises 4 officers, 11 noncommissioned officers, 16 corporals, and 166 privates, *i.e.*, 4 officers and 194 men.

It is organized in four sections of forty men each.

The sections are all organized in the same way and each is composed of four squads.

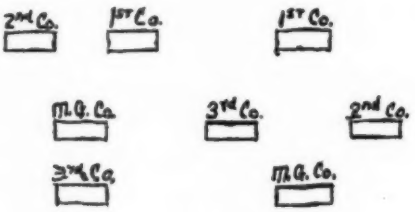


FIG. I.

Squads are organized on the following plan:

First squad, corporal and seven privates, all carrying rifles.

Second squad, corporal and six men, serving two automatic rifles.

Third squad, corporal, eight riflemen and three grenade riflemen.

Fourth squad, corporal, nine riflemen and three grenade riflemen.

In the second squad, there are two details of three men each. Each detail serves an automatic rifle. One man carries the automatic rifle and twelve magazines of twenty cartridges each. One man carries eight magazines of twenty cartridges each and a sack containing three hundred and twenty cartridges. He is armed with a pistol. The third man carries a sack containing three hundred and eighty-four cartridges, and is armed with a rifle.

A battalion of infantry comprises five companies. One is a depot company for training reserves, one is a machine-gun company, and the three remaining companies are organized as explained above.

The machine-gun company may be organized on one of three types, as follows:

Type A, a mixed company, with pack mules and light carts drawn by horses.

Type B, with light carts.

Type C, with pack mules.

All types are provided with eight guns.

In Type A, there are one hundred and thirty-nine men; Type B, one hundred and nineteen; and in Type C, one hundred and fifty-three.

The attack formations of battalions and companies vary with circumstances, but two usual formations of

the battalion for attack are as shown in Fig. 1.

For the sections of the company, the formations shown in Fig. 2 may be used, and for the squads of a section, the formations shown in Fig. 3.

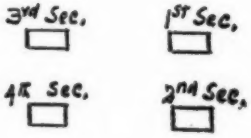


FIG. 2.

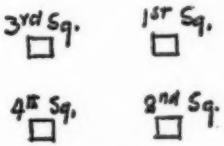


FIG. 3.

The rifle and grenade men of the second and fourth squads, in the second line, are used to fire over the skirmishers in the first line and thus create a barage for them.

The diagram in Fig. 4 illustrates the lines of informations by means of which close coöperation between an infantry regiment and a battalion of artillery is ensured.

It will be noted that the French have reduced the size of their infantry company from two hundred and fifty to one hundred and ninety-four. Due to casualties, incidents of the service, etc., all foreign powers have found it generally very difficult to get anything like full infantry companies on the fir-

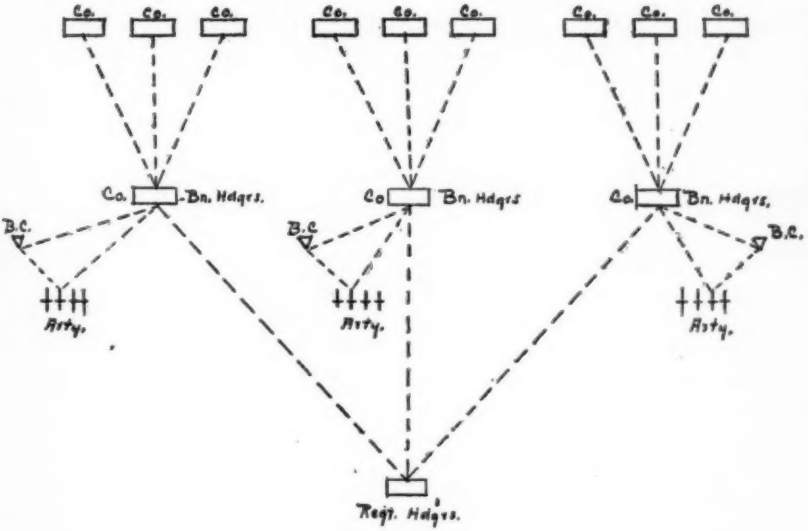


FIG. 4.

ing line. In the case of one of the Powers, the absentees from a company of two hundred and fifty men were more than 40 per cent.

There are eight machine guns with each battalion, and eight automatic rifles with each company, in the French infantry.

The British contemplate having the same number of automatic rifles, *i.e.*, Lewis guns, with each company, though they hardly have more than four at the present time, with about four machine guns to the battalion.

The bomb, automatic rifle and rifle grenade are principally relied upon during an attack. The rifle, as such, is not playing a very large part in the present phase of trench warfare. Sniping is not now taught in the French Army.

The bombing detail of a Canadian infantry battalion comprises the following:

To battalion headquarters: one officer, one noncommissioned officer and eight bombers.

To each company: thirty-two men, or eight men to the platoon, as follows: one noncommissioned officer, two bayonet men, two throwers, two carriers, one spare man.

The noncommissioned officer is armed with pistol and club; the bayonet men are armed with rifles and bayonets; the throwers are armed with bayonets and clubs; the carriers are armed with bayonets and clubs, and the spare man is armed with a rifle and bayonet.

A British Officer's Experience in Training Recruits for the Front.[1]

I am a British officer invalided from France, and before being sent to America on duty I was engaged in training raw recruits for the front. I can give the American people some information about intensive training which is based upon experience and observation in British camps and behind the trenches.

Is it possible to train a gunner in sixteen weeks?

Is it possible to train an infantryman in sixteen weeks?

When the war started numerous divisions were formed containing the usual artillery. The artillery of what was termed Kitchener's first army was fairly well equipped with senior officers, some junior officers and a fair number of efficient noncommissioned officers. They had a few obsolete guns, a few horses and a little harness. For six months it was impossible to equip them. Our large ordnance firms, with a capacity many times greater than those in the United States, were unable to supply our volunteers with guns for nearly six months. However, discipline is of great importance, and what the men missed in actual gunnery they made up in general training and discipline. Finally they were sent to the front and did well. Ammunition was scarce, however, and they had not a fair chance.

In regard to the second army matters were different. There were no noncommissioned officers of any use, and those promoted from the ranks

[1] From the *New York Sun*, April 19, 1917.

were not much good. There arrived, after a time, some regular officers and noncommissioned officers, who had been wounded. They were few in number. The junior officers knew nothing. I was one of them. We struggled on for many months without harness and guns. Please try to imagine it. The senior officers had a fearful time training young officers and men. Junior officers were sent to the school of gunnery for a month of intensive training. They learned gunnery but it took them a long time to learn how to handle men, which is of vital importance. Nine months passed with little equipment, and finally guns arrived. Two more months passed, and we were in France. Generally speaking, our gunnery was good. The driving could have been better. Horse management was bad. Toward the end of our training officers in greater numbers arrived from the front, and this was a great help. One handicap for the young officers was the old sergeant-majors and sergeants "dead" for years, who had been called up.

This gives you a rough idea of the difficulties in making an army out of nothing. The noncommissioned officer problem was the greatest difficulty. They always shielded their men and would never shoulder responsibility. When accused of negligence the reply always was, "But, sir, I told Gunner Jones to do it." No idea of making Gunner Jones do the job entered their heads. However, we found that attention to the personal appearance of both noncommissioned officers and men had wonderful results. Rigid discipline was necessary. Saluting officers and respect to officers had to be enforced, which also is of vital importance. Now matters have changed.

There are depots throughout England where officers and noncommissioned officers returning from sick leave spend a month or two before going back to the firing line. Young officers are sent here, too. Recruits and conscripts arrive in vast numbers. To the smartest officers and noncommissioned officers during their stay at the depot are given squads. There are three squads in each battery. The battery is, of course, five times above war strength. It is thoroughly equipped. A recruit enters Squad A. He is given preliminary training, and as soon as he proves himself efficient he passes to Squad B. Sometimes this takes a week. Sometimes with a dull man little can be done. A hopeless man is sent off to manual work of some kind. A safe average is three weeks. All depends upon the officer and his assistant officers and the noncommissioned officers. In Squad B the work is more advanced, and a month is usually spent here. Then the recruit is sent to Squad C, and after five weeks he is ready to go to the firing line.

Arriving in France the recruit is attached to an ammuniton column. Here he ought to be trained in campaigning generally. If he is a good man two weeks or three will find him in a battery. In the battery he is still a recruit, and in the gun crew he does minor work. Every afternoon when nothing is happening the officer of his section teaches him gun laying. His sergeant, often a fine chap, instils into him the esprit de corps of the battery. He is smartened up, and

drilled every day. He learns to his astonishment that the appearance of a soldier in a good battery at the front is better than that seen in England. He is inspected every day, and he finds that his life is more comfortable if he shaves regularly and polishes his buttons every night. If he is a good man he is an efficient gunner in five months from the time he enlisted, and one month, sometimes even more, of that time has been spent at the front. The gunner in a good battery has seldom to experience an intensive bombardment. Hence discipline is not quite so important. I hope that you understand all this.

It used to be said that you could make an infantryman in six months, but it took years to make a gunner. This war has proved the contrary to be true. It takes a long time to make a free Briton into a machine. An infantryman has all the importance of a pinion or gear wheel in a vast machine. His disciplinary training has to be such that when his senses are frightened out of him the impulse to run away has been turned into the impulse to obey. The bravest man in the world under modern shell fire becomes almost a little child with one impulse—to get out of it. And so the training of an infantry soldier is more difficult, more trying than that of the gunner. Personal courage, fine in itself on the part of a man, or a unit in the infantry, often brings tragedy.

A modern battle when communications nearly always break down has to be worked out carefully to time. A courageous company of infantry might dash forward only to be slaughtered by its own artillery, and so leave an empty space in the line of attack. The artillery, often to blame, in a case like this is blameless. The artillery observing officer may be able to see the tragedy, but his wires have been broken and he is two miles from his battery. He can do nothing. The battery is working according to orders and will continue to do so. From this you will gather the importance of discipline. Rumors of disasters and successes run round a battle field. Both are often dangerous. A poor devil worn out and almost mad will say: "Come, lads, let's get out of it." A few may even follow him. The fate of such a man if he is found out is obvious.

Knowing a good deal about the capacity of this country for the manufacture of artillery, I cannot urge too much that the equipment that we are using should be turned out. At the same time, divide what you think to be the capacity of this country for producing artillery by ten and you will be near the point.

The Allies need American men badly in France and more than they need money or equipment. The fine work being done by the British at the moment round Arras is, I suspect, the work largely of the artillery, of which we have the finest in the world. The long period of trench warfare has demoralized our infantry. Young officers don't survive long. American troops fresh and enthusiastic could save the world from many months of war.

General Officers in Prospect.

Arm of service	Authorized commissioned strength	Percentage	Present distribution of general officers	Just distribution after increments are made	To be appointed
Infantry	3264	47.3	10	19	9
Cavalry	1300	18.8	5	8	3
Field Artillery	876	12.7	2	5	3
Coast Artillery (a)	1201	17.4	5	7	2
Engineers (line officers)	263	3.8	1	2	1
Others	000	0.0	6	6	0
Total	6904	100.0	29	47	18

Editorial Department

The Army's Task.

For a good many years, it has been the habit of the Army to lay the blame for its deficiencies—and they have been many and serious—to the lack of interest which the American people have taken in their military establishment. All of which has been justified —to some extent.

It is true that the Army has long faced the task of making bricks largely without straw and it is to the credit of the Army that it has kept at its task with commendable persistence. Except for the short periods when the Country has stood in need of its military forces, public interest has manifested itself in a grudging support which has sent the Army about its task with every excuse for little enthusiasm. The results have been exactly what might have been expected—with haphazard, piecemeal and ineffective support, the efforts of the army have been correspondingly haphazard, piecemeal and ineffective.

The condition in which the Army finds itself in consequence is better described by telling what it is not. In matters of instruction and training, it is not up to date. In spite of the example of two and one-half years of war, in which the last word in instruction has been developed and practised, the Army has not progressed beyond the point where it was at the outbreak of the war. The experience on the Mexican border has been valuable in that it has brought about a higher degree of efficiency in the instruction to which we have been accustomed, but it has not brought about any change in the kind of instruction. As has been pointed out heretofore, many of the latest developments in modern warfare are a sealed book to us. Even in the elementary principle of teamwork, we have been forced to confine ourselves largely to theory. Handicapped by an obsolete system and governed largely by expediency, we have scarcely emerged from the period of individual instruction. Confined by the rut into which we have partly fallen and have been partly pushed, we have contented ourselves with doing the best "under the circumstances." We have made no move toward changing the circumstances.

In a word, the war on which we are embarked finds the Army but illy prepared to play its part.

However, it is not the purpose of this writing to rake over the dead ashes of the past. That past is gone—forever, we sincerely hope. We are done with expediency, with theorizing, with makeshifts. Our concern from now on is with the future, a future pregnant with stern realities.

At no time in the history of our Country, has the Army ever faced a prospect such as now confronts it. At no time in our history, has the Army ever before prepared to battle a first-class nation in arms. At no time, as to-day, has it ever enjoyed the eager, united, and unstinted support of the Country. At no time before, has it ever had at its disposal the unlimited material and tools with which to build for the Country an efficient fighting machine. To-day, it has all that it might desire.

In other words, opportunity is at hand, opportunity to materialize the dreams of yesterday into the realities of tomorrow, the opportunity to cease playing at war and begin making war.

With opportunity comes a serious responsibility. The people of this country are thoroughly, though tardily, awakened. As far as lies within their power, they are preparing for war in its grimmest sense. In doing so, they cherish no illusions. They are staring facts in the face in a most matter-of-fact manner. They are preparing to pour out their money, their material and their manhood in defence of the principles which they believe to be right and true. The people of the country can do no more. Upon the Army rests the responsibility for converting these resources into fighting efficiency.

It is a monumental task, this building up from the very beginning, a task that might well strain a well-organized and perfected machinery. It is a task before which our meager and imperfectly prepared personnel might well quail, one which can only be met successfully by unswerving determination, unswerving effort and unswerving enthusiasm, a task that will call for courage of the highest kind to withstand the handicaps imposed by our circumstances, and initiative of the boldest kind to hurdle the obstacles which will inevitably present themselves. It is a task for which our past experience will furnish little precedent, one in which it would be well to rid ourselves of precedent and build anew on the foundation of practical results. It is a task in which form and method should not be permitted to weigh themselves in the balance with practical results, one in which the red tape of custom, convention and precedent should find no place.

In short, it is a task for shirtsleeves, sweat and shortcuts.

Heretofore, we have been as a class apart. Hereafter our work will carry us into the heart of the people. With deeds, not words, we are about to show the Country the true spirit of military service, to demonstrate that ours is not a profession of empty forms and peacock display, but of substantial and lasting benefits.

In a double sense, the future of the Country rests with the Army. It must not only go about the huge task of immediately building a machine to meet the demands of war, but, by educating the people to the benefits of military life and training, it must insure the Country for all time against a repetition of the circumstances with which we now find ourselves surrounded.

The Army must so clearly demonstrate to the Country the meaning of military training that the question of its future adoption and continuance will be decided in the affirmative on its own merits, not by the demands of necessity or expediency. In other words, the Army must be the great exemplar to bring home to the people of this country a realizing sense of democracy as applied to citizenship.

Both tasks are equally important, equally great. The Army will not hesitate at either. It will meet its opportunity more than half way. It will cast off its traditional shackles of form and obsolete precedent. It will grow young and strong in the intensity of its work. It will welcome obstacles for the joy of overcoming them. It will do the Country's work. It will deliver the goods.

The Future.

The United States will purge itself of indolence, indifference, greed, and the 'cankers of a calm world and a long peace.' Its young men will turn from trifling to stern tasks, and will become strong men. Its women will prove their devotion. Its resources will be used for the defence of independence and liberty, not merely for the promotion of ease. Its institutions will take on a new meaning, its flag a fresh lustre. The nation will emerge cleaner, better, stronger than before.—*The Post*, Washington, D. C.

This is a bold prophecy, one which every true American wishes from the bottom of his heart to see fulfilled. The qualities which are enumerated as in store for us are those which went into the making of the Country. They are the qualities which make for greatness in a country, and without which no nation can hope long to endure.

Individualism, toward which we have been slowly but surely drifting, is not a negative principle. It is an active principle, thriving best in the calm periods of peace and prosperity, a principle utterly opposed to the spirit of nationalism upon which every country must rest the cornerstone of its greatness. It is the forerunner of selfishness, greed, disregard for the law and all of the other elements which make for decay in a nation.

Its evil is as insidious as it is great. It creeps upon us unawares. It lulls our senses with the pleasing atmosphere of ease, and robs our souls of their iron.

Characteristic of individualism is a lack of perspective, a mental myopia which deprives us of the power to see values beyond the limited horizon of our personal interests.

An evil so great calls for a drastic remedy—a shock to arrest the course of selfish absorption, disaster to restore true values in perspective, travail to rejuvenate dormant energies, and suffering to purge the soul.

War furnishes all of these. No sane man invites its penalties except as an alternative for evils which cannot be endured. There is but one inspiration powerful enough to carry frail humanity through its acid test—the inspiration of the Country's life and future. Thus inspired, the penalties lose their magnitude—a year or two of suffering against the centuries of the future; a tithe of our manhood of to-day against the countless men of future generations.

The price looms large when viewed from the standpoint of our own generation and through the murky atmosphere of our own interests. When viewed from the standpoint of the future—when we take into account the welfare and security of our sons, our son's sons and their sons in turn—it is a pittance to pay for their unity, their security and their honor.

Let us not be misunderstood. This is the thought of the soldier, the man who knows the misery which war brings in its train, the man who knows that it is for him to undergo the full measure and to pay the deadly toll; but who faces the prospect cheerfully for the sake of a future for those who may be left behind.

Night Operations

A Department devoted to the interest of newly-commissioned Infantry officers, officers of the Infantry Officers' Reserve Corps and candidates for commission

Conducted by Capt. W. H. Waldron, 29th Infantry

Field Service Regulations

Q. What are the two general classes of military information?

A. 1. That collected by the General Staff in time of peace.

2. That obtained by troops in the field after the outbreak of hostilities. (9)

Q. To what does the information obtained in time of peace relate?

A. To the geography, topography, resources and military strength of the various nations, and it enables the War Department to decide upon the size of an army or expedition, the proportion of the different arms, character of clothing and equipment, that may be necessary in the event of war. (9)

Q. To what does the information in time of war relate?

A. To the theatre of operations and the position, strength and intentions of the enemy in the field. The possession of this information is absolutely essential in order that a commander may properly make his estimate of the situation, come to a decision as to what he is going to do, and issue his orders. (9)

Q. What are the sources of information in the field?

A. 1. Higher commanders. In issuing field orders, the commander, in his first paragraph, gives all the information of the enemy and his own troops in his possession, or which it is intended subordinate commanders should know.

2. Adjoining troops. Troops in active campaign always keep the commanders of nearby troops informed of the action they are taking.

3. Inhabitants. In hostile territory, influential persons, especially those supposed to be active in the enemy's cause, may be seized and their persons and houses searched.

4. Newspapers, letters and telegraph files. Letters and newspapers found in post offices and telegraph files are carefully searched and everything of importance sent to higher authority.

5. Prisoners. Prisoners, captured from the enemy, are carefully questioned.

6. Deserters and spies.

7. Maps. Local maps of recent date may contain most valuable information.

8. Reconnaissance. (9-10)

Q. How does a commander gain a knowledge of the terrain over which he intends to operate?

A. By a careful study of available maps, supplemented by thorough reconnaissance. (9)

Q. What disposition is made of information that is gained?

A. Information received by any person in the military service, and the action taken thereon, must be promptly reported to the proper military superior. This superior, in the case of forces larger than a brigade, is the chief of staff, by whom it is referred to the intelligence section of the general staff group at headquarters. In the division staff this is known as the third, or intelligence, section of the general staff and it concerns itself with the movements and dispositions of the enemy, including explorations, reconnaissance and the gathering and distribution of information. (9-26)

Q. What limitations are placed on the discussion of military information?

A. Unless instructions are given to spread false information, all persons connected with the military service are forbidden

to discuss the military situation, plans, movements, etc., with or in the presence of civilians of any age, sex or nationality.

Q. What do you understand by the term "reconnaissance"?

A. It is a military term used to designate the work of troops or individuals in gathering information in the field. (11)

Q. When does reconnaissance begin and end?

A. It begins as soon as the theatre of possible operations is entered and ends at the conclusion of the campaign. Note: No matter what other sources of information may be available reconnaissance must be depended upon to obtain the information upon which all tactical movements should be based. (11)

Q. What are the functions of the aero squadron in reconnaissance?

A. In a division or larger force, it will operate in advance of the independent cavalry, for the purpose of locating the enemy and keeping track of his movements. (12)

Q. What are the general duties of the cavalry in reconnaissance?

A. 1. From the beginning of the campaign, it seeks to determine the enemy's strength and dispositions.

2. It protects its own army against surprise, screens its movements, and insures the safety of the other arms.

3. It defeats the opposing cavalry and expels it from the field.

4. As the opposing armies draw nearer to each other, it endeavors to secure control of the ground between, and bends every effort to that continuous and close reconnaissance of the enemy's forces so vital to success. (13)

Q. Distinguish between independent cavalry and divisional cavalry.

A. 1. Independent cavalry is a body of cavalry operating in advance of the main force and responsible only to the supreme commander of the force with which it is operating.

2. Divisional cavalry is that which is attached to an infantry division. The force normally attached to an infantry division is one regiment of cavalry. When the division is operating independently, this cavalry may be employed as independent cavalry. When the division is operating as a part of a field army, the divisional cavalry is generally attached to the divisional covering troops.

Q. What are the functions of independent cavalry?

A. 1. It precedes the advance of the force at such distance as may be practicable.

2. If it is strong enough to defeat the enemy's cavalry, it should locate the hostile infantry and artillery and determine their approximate strength.

3. If it is weaker than the enemy's cavalry, it must rely upon the work of strategical and tactical patrols to obtain detailed information of the enemy or it must be assisted by the other arms.

4. On very wide fronts, an army is generally covered by two or more bodies of independent cavalry; each is informed of the extent of ground it is to cover and keeps in touch with the neighboring cavalry. (14)

Q. What are the functions of the divisional cavalry?

A. 1. Within its powers and limitations, it furnishes immediate security for the main body.

2. Though its reconnaissance is more restricted than that of the independent cavalry, it goes more into detail and gathers information as to the resources of the country, roads, camping places, etc.

3. As combat becomes imminent and the independent cavalry is drawn off to a flank, the divisional cavalry must be especially active to guard against surprise, gain information of the enemy's movements, and prevent the incursion of his patrols.

4. When there is independent cavalry in front, it maintains connection with it; when not, it reconnoitres far to the front and gains touch with the enemy. (15)

Q. What is the general scope of the infantry reconnaissance?

A. 1. The close-in infantry reconnaissance is necessary for the immediate security of the troops and to determine the immediate dispositions of the enemy.

2. In the absence of cavalry, extended reconnaissance is made by infantry patrols and scouts.

3. When the country is rough and broken,

infantry reconnaissance may be necessary.

Q. What factors determine the extent of the reconnaissance immediately preceding combat?

A. 1. The time that can be spared for the purpose without losing the initiative in action.
2. The character of the information desired.
3. The efficiency of the measures taken by the enemy to conceal his dispositions.

Q. Upon what does the strength of the force engaged in reconnaissance depend?

A. 1. The character of the information desired. When detailed information of the enemy's position is desired, the strength of the reconnoitring forces must be sufficient to cause the deployment of his infantry and the opening of the fire by at least a part of his artillery.
2. The nature of the hostile screen. In this case the combat reconnaissance may develop into the opening phases of the combat, and care must be taken that enough troops are employed to change the course of the attack, if the information secured calls for such action. (18)

Q. Describe the successive steps of the reconnaissance and development of an enemy in position.

A. 1. The independent cavalry first comes in contact, drives in the enemy cavalry and gains such information as is possible; then, when the attacking force draws near, it withdraws to one or both flanks.
2. The advance cavalry, usually attached to the advance guard, and closely backed up by it, continues the reconnaissance begun by the independent cavalry.
3. The advance of the infantry will finally force back all of the advance detachments of the enemy and bare his position. The artillery will assist the advance by opening fire on any targets of importance that the infantry advance may uncover.
4. The enemy will have to disclose his artillery and infantry positions to keep down the fire of the hostile artillery and to stop the advance of the opposing infantry.
5. The information thus gained will enable the commander to formulate his plan of action. (19)

Q. What measures take the place of reconnaissance in rencontre or meeting engagements?

A. The measures for security on the march must be relied upon to take the place of the more complete reconnaissance which the necessity of obtaining the initiative in deployments forbids. (19)

Q. What reconnaissance is required of the infantry during combat?

A. 1. Such as will enable it to keep contact with the enemy.
2. Acquaint itself with the terrain in the front.
3. To protect its flanks and rear. (20)

Q. What reconnaissance is required of the aero squadron during combat?

A. It will operate around the flanks and over the rear of his position, for the purpose of reporting his dispositions, the approach of reinforcements and the beginning of a withdrawal. (21)

Q. What reconnaissance is required of cavalry during combat?

A. It will conduct an extended reconnaissance with small detachments around and to the rear of enemy's position. (22)

Q. What is a patrol?

A. The term patrol is used to designate small detachments employed for a variety of purposes, the name of the detachment indicating its duty as, visiting, connecting, combat, exploring, reconnoitring, flanking, harassing, and pursuing patrols.

Q. What is the chief duty of reconnoitring patrols?

A. To gather information. They habitually seek safety in flight, fighting only when the accomplishment of their mission demands it. (23)

Q. How do patrols vary in strength?

A. From two or three men to a company. (24)

Q. What are the advantages of small patrols over strong patrols?

A. 1. They have greater mobility.
2. They are more easily handled and controlled.
3. They do not draw heavily on the fighting strength of the command. (24)

Q. What precautions are taken by the officer sending out the patrol?

A. He verifies the detail, gives the necessary instructions and designates a second in command.

He eliminates horses of a conspicuous color, and those likely to make a noise when left alone.

He takes precautions to see that equipment is arranged so that it will not glitter in the sunlight, nor rattle. (24)

Q. What points are embraced in the orders and instructions given a patrol commander by the officer sending out the patrol?

A. 1. Where the enemy is or is supposed to be.
2. What information is desired.
3. What features are of special importance.
4. The general direction to be followed.
5. Whether friendly patrols are likely to be encountered.
6. Where messages are to be sent or where the patrol is to report.

Note.—Important and comprehensive instructions should be in writing. Precautions against capture of papers must be taken. It must be certain that orders are fully understood. Detailed instruction is, as a rule, avoided. When necessary the time of return is stated. (24)

Q. What qualifications should a patrol leader possess?

A. Patrol leaders should combine the qualities of good health, vigorous physique, keen eyesight, presence of mind, and courage, with good judgment, military training and experience.

They should be able to read maps, make sketches and send clear and concise messages.

Officers on such duty often find themselves in positions where it is necessary to consider a situation from the viewpoint of the commander and should be able to reason accordingly. (25)

Q. What governs the formation adopted by a patrol?

A. No normal formation is or should be prescribed. The patrol takes such formation as may be necessary to guard against surprise, usually with point and flankers. Scouts from the patrol may be sent out for short distances in order to extend the sphere of observation. Whatever the formation it should favor the escape of at least one man. (26)

Q. How may the composition of an enemy's force on the march be estimated from the dust raised?

A. 1. A thick, low cloud of dust indicates infantry.
2. A high, thin cloud indicates cavalry.
3. A broken cloud indicates artillery or wagon trains. (27)

Q. How may the strength of an enemy's force on the march be estimated?

A. By the time that it takes to pass a given point. A point is passed in one minute by

175 infantry, in column of squads.
110 cavalry, in column of fours, at a walk.
200 cavalry, in column of fours, at a trot.
5 guns or caissons.

By the amount of road space occupied by the column. In estimating it is assumed that infantry, in column of squads, occupies one-half yard per man; cavalry, in column of fours one yard per trooper; artillery, 20 yards per gun or caisson. (27)

Q. If the enemy is discovered, what points should the patrol leader's report contain?

A. 1. His exact location, whether deployed, marching or in camp.
2. His strength and composition. (28)

Q. What signals are authorized for use by patrols?

A. 1. Enemy in sight, in small numbers: hold the rifle above the head horizontally.
2. Enemy in sight, in force: same as above, raising and lowering the rifle.
3. Take cover: a downward motion of the hand. (29)

Q. What are the several classes of balloons and for what service are they employed?

A. 1. Free balloons: used to convey information from besieged places, the return message being sent by radiotelegraphy or carrier pigeons.
2. Captive balloons: for tactical reconnaissance, observation of artillery fire and signalling.
3. Dirigible balloons: for strategical reconnaissance, for travel to great distances, to carry a large number of ob-

servers, radio equipment, machine guns or a quantity of explosives (30)

Q. For what classes of reconnaissance are aeroplanes employed?

A. Strategical and tactical reconnaissance and the observation of artillery fire. (31)

Q. What is included in strategical reconnaissance?

A. The determining of the position, strength and direction of advance of the larger elements of an enemy's force; ascertaining the character of the roads, railroads, streams, and general military topography of the theatre of operations.

Q. What is the purpose of tactical reconnaissance?

A. It is designed to discover tactical, turning and enveloping movements, the position and strength of the enemy's general reserve, his artillery positions and the movements of his cavalry, and his tactical movements and dispositions in the rear of his lines.

Q. What is a field message?

A. In the field, the term message is generally applied to written information sent by messenger or by wire.

Q. What points are required in the composition of field messages?

A. 1. They should be brief and clear, resembling telegrams.

2. The source of the information contained in the message should be given, the writer separating what he has actually seen himself from that which has come to him second hand.

3. Expressions depending upon the viewpoint of the observer, except when reference is made to the banks of a stream and the elements of a body of troops, should not be used. Points of the compass should be employed instead.

4. Geographical names should be printed in Roman capitals.

5. When two or more features on the map have the same name or designation, they should be designated by reference to other points.

6. The message should terminate with a sentence telling the commander what the writer proposes to do next. As "I remain in observation," or "I move to cross roads 45," etc.

Q. What is a military report?

A. A more or less formal account of some military enterprise, undertaking or event, such as a march, a reconnaissance, battle, etc.

Q. What scales are authorized for military maps and sketches?

A. 1. One inch to one mile, vertical interval 60 feet; used for extended operations. The maps of our own country prepared by the Geological Survey are on a scale of 1:62500 (which is approximately 1 inch to the mile), with vertical interval 20 feet.

2. Three inches to one mile, vertical interval, 20 feet; used for road maps and sketches.

3. Six inches to one mile, vertical interval 10 feet; used for position sketches.

4. Twelve inches to one mile, vertical interval, 5 feet; used in siege operations in the field and for war games. (34)

Q. What is a war diary?

A. A record of events kept in campaign by each battalion and higher organization, each ammunition, supply and sanitary train. Entries are made daily and form a concise history of the military operations in which the organization participates. (35)

Q. What elements are included in a war diary?

A. 1. A march table, or statement of the operations, including an account of the weather, roads, camp, health of troops, etc.

2. A chronological record of events, including time and place of receipt of orders and messages, with a copy or synopsis of their contents.

3. After an engagement the war diary should contain a report of losses and captures and be accompanied by a sketch showing the positions of the command at important phases.

4. Each day's record will be attested by the adjutant or the commander, and with copies of orders and messages, sent and received, forwarded daily to the next higher commander. (35)

Q. How is military information transmitted?

A. 1. By wire. (Telegraph, buzzer, telephone.)

2. By visual signalling. (Flag, helio, lamp.)

3. By radio. (Wireless.)

4. By messenger. (Foot, mounted, cycle, motor car, aeroplane.) (36)

Q. What rules govern the transmission of messages by messengers?

A. 1. They are inclosed in envelopes and properly addressed.
2. When not confidential, they are left unsealed so that commanders along the line may read them.
3. On the envelope, is noted the name of the messenger, his time of departure and his rate of speed. Note: Ordinary speed for a mounted man means about 5 miles per hour; rapid, about 7 to 8 miles per hour; urgent, the highest speed consistent with certainty of arrival at destination.
4. The recipient of the message notes the time of receipt on the envelope and returns it to the bearer. (36)

Q. When there is danger of messages falling into unauthorized hands what precautions are taken?

A. 1. They may be sent in cipher.
2. They may be sent by two or more messengers; traveling different roads or routes.
3. Messengers are informed of the contents of messages.

Q. Describe the method employed in relaying messages?

A. When the usual means of communication cannot be established, or fail to work, relays of mounted men may become necessary. When such lines are established, connecting posts are generally placed on the roads at cross roads or road forks, bridges, etc. The distance between posts depends upon the rapidity of transmission desired, the number of men available for the service and the location of suitable stations. The usual distance is from 5 to 10 miles. The strength of posts varies from a noncommissioned officer and six men to half a troop. A record of all communications received and transmitted is kept. When a messenger arrives at a post, his message is turned over to a member of that post and relayed on to the next, the former messenger returning to his proper post. (36)

THE SERVICE OF SECURITY

Q. What elements does the service of security embrace?

A. All those measures taken by a command to protect itself from observation, annoyance, or surprise by the enemy. (37)

Q. How are the various bodies of covering troops employed in the service of security designated?

A. 1. On the march, these detachments are called advance, flank and rear guards.
2. In camp or bivouac, these troops are called outposts. (37)

Q. What are the general duties of covering troops?

A. 1. To facilitate the advance of the main body by promptly driving off small bodies of the enemy who seek to harass or delay it.
2. To remove obstacles from the line of advance.
3. To repair roads, bridges, etc.
4. To protect the main body by preventing the enemy from firing into them when in close formation.
5. To hold the enemy and thus enable the main body to deploy before coming under effective fire.
6. To prevent the enemy from discovering strength and composition of the main body.
7. In retreat, to fight delaying actions in order to gain time for the main body to make its escape or to reorganize its forces. (37)

Q. Describe the general formation assumed by covering troops?

A. 1. The cavalry; covering the front and extending around the flanks.
2. A group (advance party of the advance guard) or line of groups (the outguards of an outpost) in observation.
3. A support or line of supports; whose duty it is to furnish the observation and reconnaissance groups, and to hold the enemy pending the arrival of reinforcements.
4. A reserve. (37)

Q. What elements with respect to covering troops are contained in an order for the movement of a command?

A. 1. Explain the situation. Give all information of the enemy and of our own troops.
2. Indicate, in general terms, the plan of the commander.
3. Detail the commander and troops for each covering detachment.
4. Specify the route to be taken and the

distance to be maintained between the main body and its covering detachments.

5. Order such special reconnaissance as the commander desires to have made. (38)

Q. What proportion of a command is detailed on covering duty?

A. The strength may vary from one-twentieth to one-third of the command. (39)

Q. What compliments are paid by troops engaged in the service of security?

A. They pay no compliments. Individuals salute when they address, or are addressed by, a superior officer. (39)

Q. What is an advance guard?

A. An advance guard is a detachment of the main body which precedes and covers it on the march. (40)

Q. What are the duties of an advance guard?

A. 1. To guard against surprise and furnish information through reconnaissance to the front and flanks.

2. To push back small parties of the enemy and prevent their observing, firing upon, or delaying the advance of the main body.

3. To check the enemy's advance in force long enough to permit the main body to prepare for action.

4. When the enemy is encountered on the defensive, to seize a good position and locate his lines, care being taken not to bring on a general engagement, unless the advance guard commander is empowered to do so.

5. To remove obstacles, repair the road, and favor in every way the steady and uninterrupted advance of the main body. (40)

Q. What is the strength of an advance guard?

A. One-twentieth to one-third of the entire force. (40)

Q. What factors determine the strength and composition of the advance guard?

A. 1. The larger the force, the larger in proportion the advance guard; because it takes a large force relatively longer to deploy.

2. In large commands, it is usually composed of all arms. The proportions depend upon the character of the country, the nature of the enemy and his strength and proximity.

3. In open country, the advance guard will be strong in cavalry and field artillery.

4. In swampy country and jungle, it may be composed of infantry alone.

5. Machine guns are useful in holding places of special importance.

6. Engineers are attached for pioneer work.

7. Sanitary detachments are attached for special work. (41)

Q. What factors determine the distance between the advance guard and the main body?

A. 1. It must be sufficient to prevent needless interruptions to the march of the main body.

2. The distance must be such that sufficient time will be allowed the main body to deploy for action.

3. It must not be so great that it is impracticable to support the advance guard. (42)

Q. What are the elements of the advance guard.

A. 1. The advance cavalry.

2. The support, from which is thrown out the advance party and the covering detachments.

3. The reserve, which forms the fighting element of the advance guard. (44)

Q. What are the duties of the advance cavalry?

A. 1. It reconnoitres far enough to the front and flanks to guard the column against surprise by artillery fire, and to enable timely information to be sent to the advance guard commander.

2. If preceded by independent cavalry, the advance cavalry maintains connection therewith. If not preceded by independent cavalry, it pushes well out and endeavors to find the enemy, performing to a limited extent the functions of independent cavalry. (45)

Q. What is the strength of the support?

A. From one-fourth to one-half of the advance guard.

Q. What are the duties of the advance party?

A. It supplements the work of the advance cavalry, reconnoitring to the front and flanks to guard the support against surprise by effective rifle fire. (46)

Q. What is the point of the advance guard?

A. It is a patrol that precedes the advance party at a distance of about 150 to 200 yards. It generally consists of one squad under an officer or experienced sergeant. (46)

Q. What are the duties of the support commander?

A. 1. He marches with the advance party, or goes wherever he is needed.
2. He sees that guides are left at towns and cross roads.
3. He sees that necessary repairs are made to roads, bridges, etc.
4. He sees that information of the enemy is promptly transmitted to the advance guard commander.
5. He sees that the reconnoitring parties, sent out from the support, do their work efficiently. (46)

Q. What modifications are made in the normal formations of an advance guard when it is covering a small command only.

A. 1. A company or troop usually sends forward only a point.
2. A battalion or squadron sends forward an advance party.
3. A battalion or squadron at war strength would have an advance party of one company or troop.
4. The advance guard of a regiment would be one battalion or squadron.
5. When the advance guard is less than a battalion or squadron, the reserve is omitted. (49)

Q. What modifications are made in the advance guard covering the advance of a cavalry command?

A. The formation is similar to that of the infantry or mixed command, except that the distances between the various elements are much greater. (50)

Q. What are leading troops?

A. In a retreat the column is preceded by a body of troops designated "leading troops."

Q. What are the duties and functions of leading troops?

A. 1. To clear the road of obstacles and facilitate the withdrawal of the command.
2. They afford protection against guerillas or small parties that have succeeded in getting around the command.
3. If the rear is seriously threatened, the leading troops march practically in advance formation and have the same role. (52)

Q. What is a flank guard?

A. A covering detachment sent out to protect the flank of a column of troops on the march. (53)

Q. What formation does a flank guard assume?

A. The normal formation of a column of troops on the march. It throws out an advance guard, also covering detachments on the exposed flank. (53)

Q. What are the duties of a flank guard?

A. Their duties are similar to those of the advance guard. They maintain constant communication with the troops of the main body and keep abreast of the unit from which they are sent out. They cover exposed points to protect the passage of the main body. (53)

Q. Under what circumstances does the flank guard become of great importance?

A. When the main body is executing a flank march. (54)

Q. What factors determine the strength and composition of a rear guard?

A. 1. The nature of the country and the strength and character of the pursuing force.
2. Machine guns are especially useful in covering the crossings of rivers and the passage of defiles. (56)

Q. From what troops is the rear guard usually taken?

A. From those who have had previous local successes, or have suffered little loss and are comparatively fresh. (56)

Q. What is the general formation of a rear guard?

A. The formation is similar to that of an advance guard reversed. Its elements are the rear cavalry; the support, divided into the support proper and the rear party; and the reserve, which is the largest body and marches nearest to the rear of the main body. (57)

Q. What is an outpost?

A. A body of troops sent out to cover the front and flanks of a body of troops when halted, to protect it from surprise, and delay the enemy long enough for it to prepare for action. (60)

Q. Upon what does the size and disposition of the outpost depend?

A. The size of the whole command; the proximity of the enemy and the situation with respect to him; and the nature of the terrain. (60)

Q. What is the size of outpost for the various units?

A. 1. For a single company in bivouac, a few sentinels and patrols will suffice.
2. For a battalion, a company.
3. For a regiment, a battalion.
4. For a brigade, a regiment.

Note.—The outpost should be no stronger than is necessary to provide reasonable security. The integrity of units is preserved whenever practicable. (60)

Q. What troops are generally detailed for the outpost?

A. At the end of the day's march on the advance, the advance guard generally forms the outpost.

In retreat, the main body furnishes the outpost for the night. (61)

Q. What are the functions of the several arms on outpost duty?

A. 1. Infantry: The infantry is charged with the duty of local observation, especially at night, and with resisting the enemy long enough for the main body to prepare for action. It conducts the local reconnaissance in front of the outpost lines.
2. Cavalry: The cavalry is charged with the duty of reconnaissance in front and to the flanks of the outpost position.
3. Artillery: Artillery is useful to the outpost when it can be posted so that its fire can sweep defiles or large open spaces and when it commands positions that may be occupied by hostile artillery.
4. Machine guns are useful to command approaches and check sudden advances of the enemy.
5. Engineers are attached to the outpost to assist in laying out and constructing the defensive works connected therewith, clearing the field of fire, and preparing lateral and rearward communications. (63)

Q. What is the distribution of outpost troops?

A. 1. The reserve, constituting the main body of the outpost, is held at some central point under the direct command of the outpost commander, so that it can readily support any of the troops in front, or hold a rallying position upon which they may retire. Its strength may be from one-fourth to two-thirds of the entire outpost.
2. The supports constitute a line of supporting and resisting detachments, varying in size from a half a company to a battalion. They furnish troops for the outguards, and are generally, though not necessarily, posted on the line of resistance of the outpost.
3. The outguards constitute the line of small detachments most advanced to the front. They are posted along the line of observations, and furnish the sentinel posts of the outpost.
4. The advance cavalry reconnoitres in advance of the line of observation by day and is withdrawn behind the lines at night. (64) (65)

Q. How are the supports numbered?

A. They are numbered consecutively from right to left: as Support No. 1, Support No. 2, etc. (66)

Q. Where are the suports usually posted?

A. On or near a road leading towards the enemy. (66)

Q. How are outguards classified?

A. Pickets, sentry squads and cossack posts. (67)

Q. What is a picket?

A. A group consisting of two or more squads ordinarily not more than half a company—posted in the line of outguards to cover a given sector. (68)

Q. Where are pickets usually posted?

A. At the most important points on the line of outguards, for example, at road forks or cross roads. (68)

Q. Upon what does the strength of the picket depend?

A. The number of small groups that it has to furnish in order to cover its sector, and the amount of patrolling that has to be carried on. (68)

Q. What is a sentry squad?

A. A sentry squad is a squad posted in observation. It posts a double sentinel in observation, the remaining men resting nearby and furnishing reliefs for the sentinels. In some cases, it may be required to furnish a patrol. (69)

Q. What is a cossack post?

A. It is an observation group composed of four men, similar to the sentry squad; it posts a single sentinel. The cossack post commander and three privates furnish the reliefs for the single sentinel post. (70)

Q. What use is made of patrols in connection with outpost service?

A. Instead of using outguards along the entire front of observation, part of this front may be covered by patrols only. These should be used to cover such sections of the front as can be crossed by the enemy only with difficulty and over which he is not likely to attempt a crossing after dark. (73)

Q. What resistance is required to be made by the several elements of the outpost?

A. Each successive element of the outpost must afford sufficient resistence to delay the enemy the length of time necessary for the next succeeding body to prepare to receive him. (74)

Q. How is connection maintained between the several elements of the outpost?

A. By patrols. (74)

Q. What are detached posts?

A. They are detachments sent out from the reserve to occupy positions of importance that are not included in the general line assigned to the supports. In some instances they may be sent out from the main body to cover points not included in the general outpost line. (75)

Q. What reference to the outpost is contained in the halt order issued by the commander of a force?

A. A paragraph:

1. Detailing the troops of outpost duty.
2. Assigning an outpost commander.
3. Designating the general line to be occupied.
4. When practicable, points of the general line to be held in case of attack. (77)

Q. What elements are included in the order of the outpost commander?

A. 1. All information of the enemy and our own troops that is necessary for the proper guidance of subordinates.
2. The designation of the troops to constitute the supports and the detailing of a commander for each.
3. The assignment of the sector that each support is to cover.
4. The detail of troops and commanders for all detached posts.
5. Orders for any special reconnaissance that it is desired be made.
6. The location and disposition of the reserve.
7. The disposition of the trains if they are ordered to join the outpost troops.
8. The place where information is to be sent. (77)

Q. Describe in detail the method employed in posting the outpost.

A. 1. The commander of the whole force issues his halt order. Based on this the outpost commander issues his order.
2. The reserve is marched directly to its designated position, maintaining connection with the main body, the supports and the detached posts that may have been sent out from it.
3. The supports march to their positions, using the necessary covering detachments. Each support sends forward a detachment to cover the posting of the outguards along the sector that it is to occupy. These detachments may be small patrols or a line of skirmishers. The support commander details the troops for each outguard and assigns a commander, defines its location and sector of the front to be covered. Posts sentinels at the post of the support. The necessary reconnoitring patrols are sent out. Connection is established with the reserve, the adjoining supports, and all the elements of the support itself.
4. Each outguard is marched to its designated location where sentinels are posted to cover the front of the sector assigned to the outguard. Connection is gained with adjoining outguards and sentinel posts and with the support. The sentinels are given their instructions, which include the location and direction of the enemy, the number of the post, the position of the adjoining sentinel posts and outguards, the names of all towns, roads, rivers and principal features in sight.
5. The commander of each element of the outpost explains the military situation to the men of his command in sufficient detail to enable all of them to act intelligently under the circumstances. As

soon as the several elements are posted the commander conducts an inspection, makes any changes that may be necessary and renders a report of his dispositions to his next superior. Such intrenching and field works are constructed as the situation demands. (78-79-80)

Q. What are the hours of special danger on the outposts?

A. Evening and before dawn. The enemy may attack late in the day in order to establish himself on captured ground by intrenching during the night; or he may send forward troops during the night under the cover of darkness in order to make a strong attack at early dawn.

Q. At what hour is the outpost generally relieved?

A. At daylight. This makes a double strength on the outpost line at the hour of greatest danger.

Q. What is an examining post?

A. A small detachment under the command of an officer or noncommissioned officer, stationed at some convenient point to examine strangers, receive flags of truce brought in by outguards or patrols.

Q. Under what circumstances are examining posts used?

A. 1. When the outguards do not speak the language of the country or the enemy.

2. When preparations are being made for a movement and strict scrutiny at the outguards has been ordered.

3. At sieges, whether, in attack or defense. (83)

Announcements

Attention!

There is every prospect that we will all be widely scattered for the next few months, if not years, and that each of us will have hard work keeping track of ourself—much less of our friends. The INFANTRY JOURNAL has been having some trouble of late in keeping in touch with our members and subscribers and it must now ask for coöperation in the future.

The INFANTRY JOURNAL has reached a point where, if it is not an actual necessity to members of the Association and subscribers, it is at least something they like to have around the house. The Council has made arrangements whereby it is hoped the JOURNAL may continue its existence throughout the troublous period ahead. We feel that we will be able to keep the JOURNAL going, but we realize the difficulties before us. Officers will change stations frequently and suddenly. It is altogether possible that monthly lists of addresses will not be available. We will be entirely at sea unless members and subscribers keep us informed of their whereabouts.

So, if you want the INFANTRY JOURNAL—if you want to keep it alive—don't fail to let us know of your change of address.

Of course, it would save us a lot of trouble and make things very pleasant all around, if members and subscribers would think to remit, whether they receive a statement or not, but realizing the difficulty and inconvenience for officers in the field to make remittance, we are trying to arrange with the supply officers of each regiment to receive payments and if our members will coöperate in this plan most of our difficulties will be solved.

Please consider this as an individual appeal and tuck it away in your mind, and think of it every time you receive a copy of the INFANTRY JOURNAL.

THE INFANTRY JOURNAL
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Book Reviews

Century of War. A Précis of the World's Campaigns. By Capt. G. de St. C. Stevenson, Royal West Kent Regiment. London: Hugh Rees, Ltd., 1916. Cloth, 12mo., 133 pages. Price, 2s. 6d.

It is hard to realize that during the past century there have been but two or three warless years. Here is food for those pacifists who declare that all disputes can be settled by arbitration. The comparatively unimportant struggles of the smaller nations usually pass by unheeded because they do not affect the vital interests of the country, nevertheless it is a surprising fact that at practically no time in the last one hundred years has there been universal peace.

This short volume is a book of reference giving merely the causes of the wars, numbers engaged, dates, commanders, a résumé of the more important operations and general results. Four and a half pages, for instance, are devoted to the Russo-Japanese war, so the reader does not let the grass grow under his feet in any particular theatre of operations, but enjoys variety in jumping from one portion of the globe to another.

Most of us have rather vague ideas concerning numerous minor campaigns. These are treated concisely, their relation to other more important events is shown and from beginning to end the book will be found to be very valuable as well as most interesting.

P. C. KALLOCH, JR.,
1st Lt. of Infantry.

Lessons in Visual Signalling. By Lieutenant M. A. Palen, 12th U. S. Infantry, Menasha (Wis.). George Banta Publishing Company, 1916. Cloth, 60 pages, 4½ x 5¾ inches. Price, 60 cents.

A revision and extension of the pamphlet by the same author published several years ago. The author disclaims any intention to have written a treatise on visual signalling. His aim has merely been to furnish a system to train men in this branch of the military art. The system as set forth is the result of the author's efforts to train his company in the use of the flag kit furnished by the Signal Corps.

The instruction is given in eight lessons, each lesson containing an application of the subject matter. The system set forth is definite, simple, and progressive, beginning with letters of only one element and advancing to the more complex letters of the alphabet. Each lesson contains words and sentences with which the soldier may practise, and may thus definitely fix in his mind the appearance of the letters.

The method upon which these lessons are based was developed as the result of practical experience with enlisted men. It has stood the test in practice and is especially commended to the instructor who approaches this subject without a definite plan of instruction. This book should be useful alike to the Regular Army and the National Guard.

THE UNITED STATES INFANTRY ASSOCIATION

"The object of the Association shall be to promote the efficiency of the Infantry arm of the military service of our country by maintaining its best standards and traditions, by fostering esprit de corps, by the dissemination of professional knowledge, and by the exchange of ideas as to the utilization of such knowledge with particular reference to the rôle of Infantry in modern war."—Article III of the Constitution.

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All commissioned officers in good standing, or former commissioned officers of honorable record of the regular or volunteer military or naval service including Reserve Corps, and of the National Guard are eligible for regular or associate membership in the Association. Membership dates from the first day of January or July nearest the date of enrollment.

Dues are $1.00 annually, payable in advance. Members may obtain the JOURNAL for $2.00 per year.

All communications should be addressed to the Secretary, the United States Infantry Association, Room 506, Union Trust Building, Washington, D. C. Cable address: Infantry, Washington.

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The subject will be optional with the writer but must be one of vital interest to the Infantry arm of the service. The importance and timeliness of the subject will be one of the factors considered in making the award.

RULES.

For rules governing the competition see July-August, 1916, number of the INFANTRY JOURNAL.

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Lufkin, F. A., Captain, Hawaiian National Guard.

Mangan, Walter David, 1st Lieutenant, 35th U. S. Infantry.

Miller, Maurice L., 1st Lieutenant, 35th U. S. Infantry.

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O'Day, R. M., 2d Lieutenant, 9th U. S. Infantry.

Powell, Clifford, Captain, Iowa National Guard.

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Schick, Jacob, Captain, 26th U. S. Infantry.

Swanberg, Hugo H., Captain, Officers' Reserve Corps.

Westover, Wendell, 2d Lieutenant, Officers' Reserve Corps.

Weyand, Alexander M., 1st Lieutenant, 34th U. S. Infantry.

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Infantry Journal Advertiser

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No. 29

WASHINGTON, D. C.
MAY 1, 1917.

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